Hitchcock's Machine Tool Blue Book

JUNE, 1936 THIRTY-FIRST YEAR

Cataract HARDINGE Cataract

PRECISION BENCH MILLING MACHINES

For rapid and accurate milling service in production, toolroom and experimental departments. A sturdy, responsive time saver with special features and compactness for ease of operation.

Ask for Bulletin MM

HARDINGE BROTHERS, INC., - - ELMIRA, N. Y.

CHICAGO — NEW YORK — DETROIT

PUBLISHED AT 508 So. DEARBORN ST. CHICAGO

For all-around use and variety of cuts—for shops and stock rooms where small delicate work is apt to follow ponderous pieces, there is no saw built that equals a MARVEL No. 8. This flexible, universal machine tool is always ready for any job without adjustment or special "setting-up;" is ready for large work, small work, straight cutting-off of bar stock, notching, angular or mitre work, and for both power and hand feed jobs.

Its expansive, T-slotted bed eliminates the need for most fixtures and jigs—work is set up with standard tools as on a planer or shaper and the blade fed through the work assuring a straight accurate cut always. Frequently more than one cut can be made without shifting the work on the bed and setting up time is cut to a fraction. Handling all work from ⅛"x½" to 18"x18" the MARVEL No. 8 is the logical first saw for any warehouse, tool room or die shop.

Write for Bulletin No. 800A

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

341 N. Francisco Ave., CHICAGO, U. S. A.

Send for this Circular

This new circular illustrates and describes the complete line of Sundstrand Balancing Tools, Airport Service and Propeller Checking Equipment.

Sundstrand Balancing Tools save many times their cost on balancing, straightening and truing operations. With the exception of the No. 5 Extra Heavy Duty size, these tools are portable and can be placed in any convenient location without leveling.

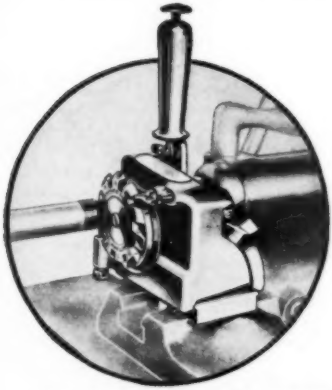
Sundstrand Bench Centers are used extensively for accurately checking parts between centers. They are rigid, compact, portable.

The circular contains complete information about these accurate, economical, time saving tools. Write for a copy, ***today***.

SUNDSTRAND MACHINE TOOL CO.
2535 Eleventh Street, Rockford, Illinois, U. S. A.

Rivett

IMPROVED THREAD TOOL



LOW COST THREADS IN QUANTITY

Rivett Thread Tool mounts on any screw cutting engine lathe and cuts any diameter or form (except square) of thread, six pitch or finer. The Thread Tool is a holder for a ten tooth cutter with means for indexing the cutter to present each of the ten teeth successively to the work.

For complete details see Bulletin 110-A

Rivett Lathe & Grinder, Inc.

Brighton, Boston, Mass.

Hitchcock's
Machine Tool Blue Book

Selected Circulation — 20,000 Monthly

JUNE, 1936 — THIRTY-FIRST YEAR

The Soldiers' Bonus

Whether we do or do not believe that the immediate payment of the Soldiers' Bonus is a wise policy, the fact remains that Uncle Sam is about to pour out nearly two billion dollars to the men who served during the war.

That is a lot of money, and most of it will be quickly spent. It will practically bounce into circulation, and the effect will be felt in every line of business.

This is only one of several factors that will retard the usual summer slump, and nullify to a large extent the presidential election year doldrums.

So do not put up your shutters and hibernate during the summer. If you do you will miss some nice business. This is going to be one of the best mid-year seasons we have had for quite some while.

The world do move and we are moving optimistically with it.

Published By

Hitchcock Publishing Co.

508 S. Dearborn St., Chicago, Ill.

Consult the Classified Finding Index for your requirements

"Die Making"

Do ALL Yo
A

Showing the machine set up with the 3 in 1 head with heavy duty Vixon file holder in place—screw feed to file.

A Precision Machi
Convertible to do—

- Horizontal Boring
- Vertical Boring
- Die Sinking
- Radial Drilling
- Heavy Filing
- Light Filing
- Surface Grinding
- Cylindrical Grindin
- Bore Grinding
- Key Seating
- Lath Work
- Horizontal Milling
- Vertical Milling
- Shaping
- Slotting
- Heavy Sawing
- Jig Sawing
- Lapping
- Gauge Grinding
- Broaching

DEALERS WANTED

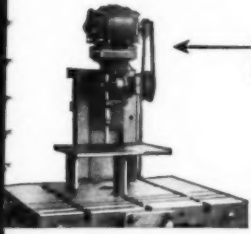
Alert, progressive dealers wanted in territories still open. Write us at once.

Hack Universal Die Ma

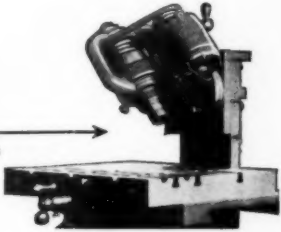
"Revolutionized!

Die Making on One Machine—
hanges made in a few Minutes

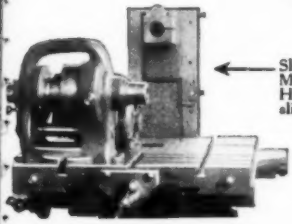
Here are Three of this Versatile Machine's many Set-ups



Showing the Universal Down Stroke Die Filing Head attached to Hack Universal Die Making Machine.



Showing the Milling Head Attachment on the Hack Universal Die Making Machine.

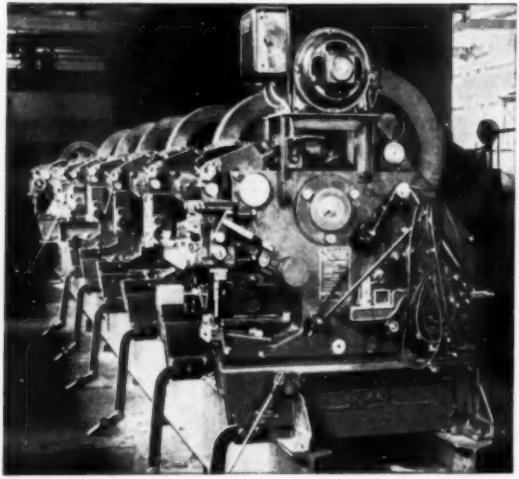


Showing the Universal Die Making Machine with self-contained Lathe Head (tail stock and compound slide not shown).

This machine has many more applications and is not limited to die and tool work but will also do metal pattern work on a very efficient basis.

Send for Complete Information

ng Machine Co., 440 N. Oakley Blvd. CHICAGO, ILL.



Off the Production Line into Production

Put one of these Universal Iron Workers to work in your plant and watch punching and cutting costs drop unbelievably! Hundreds of users have paid for a Buffalo Iron Worker with less than a year's savings—and some of the machines have been in use for fifteen to twenty years! You can cut plates or flats, punch holes, cut bars with this machine—keeping three men busy at one time.

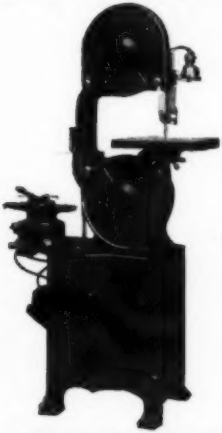
Bulletin 322 gives full details and capacities.

BUFFALO FORGE COMPANY

161 Mortimer St., Buffalo, N. Y.

In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

New! Grob 14" Metal Band Saw



$125.

With Motor and Air Pump

SPECIFICATIONS

- ¼ H.P., 110 volt A.C. Single Phase Motor.
- 3 speeds, 60, 90 and 120 feet per minute to the band saw.
- Silent V belt drive.
- Tilting table 14"x 4".
- All revolving members mounted on ball bearings.
- ⅛" up to ½" wide standard saw bands can be used.
- Distance from floor to table 45" total height 68½".
- Net weight, complete with motor, brazing device, air pump and electrical grinder, 380 pounds.

GROB FILING MACHINE

Type B-3 BENCH MODEL

$157.00

Complete with motor and switch

Simply constructed, easy to operate. Makes smooth, straight, clean cuts with speed and accuracy.

Larger Sizes Also Available

Write for Full Information

Originators of
Open End Band Saws and Continuous Filing Machines

GROB BROS., 9700 National Ave., West Allis, Wisconsin

NEW AG3-M

TRADE MARK
FULFLO
REG. U.S. PAT. OFF.

CENTRIFUGAL WATER PUMP

MODERN

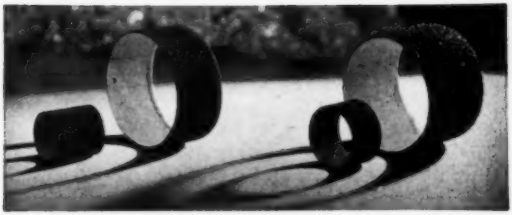
★ DESIGN
★ CONSTRUCTION
★ PERFOMANCE

SPECIFICATIONS

¼ H. P.—BALL BEARING—1725 R. P. M. MOTOR
25 GALLONS PER MINUTE WITH 10 FT. HEAD—
IRON BODY—BRONZE IMPELLER—
SPRING TENSION PACKING—
STRAIGHT OR PRIMING COVER OPTIONAL—
PUMP SHAFT REPLACEABLE.

FULFLO SPECIALTIES COMPANY, INC.

BLANCHESTER, OHIO



ABRASIVE BELTS AND SLEEVES

A new type belt of lapless construction. Used with rubber sanding and polishing drums and wheels, on steel, brass, bronze, aluminum, wood, etc. The drum is live rubber on which the abrasive belt is held by tightening a nut against compression washers. More economical and convenient to use than built up rag buffs.

Write for complete details on belts and drums

Pratt & Whitney Division

Niles-Bement-Pond Co.

HARTFORD :-: :-: CONN.

A NEW DEVELOPMENT FOR HIGH SPEED TAPPING

SEND FOR YOUR COPY OF OUR NEW LITERATURE

PROCUNIER SAFETY CHUCK CO.

"PIONEERS OF SAFETY TAPPING"

14 So. Clinton St., Chicago, Illinois

Collets Of Every Description

for All Purposes

What are your requirements on chucking?

Modern Collets are made of a special steel and have a hard, long-wearing surface with a tough, springy core. Modern Collets are guaranteed accurate in design and taper is ground true with the hole. They are deeply corrugated to give a positive grip.

Modern Collets are designed to give a better gripping surface because of the deeper and better formed corrugations. Locking fingers and shoes will last longer, and Modern Collets exert far less strain on chucking cam and chucking cam roller pin.

For complete information on feed-fingers, cams, shaving tools and various other parts for screw machines, write for our catalog No. 32.

Modern Collet & Machine Co.

401 Salliotte Street, Ecorse, Michigan

SANDING DRUMS
AND
Abrasive Sleeves

NEW!

An interesting
NEW BULLETIN
complete with price information. Write for it today.

Improved Expanding Rubber Drums . . . accurately balanced . . . precision built. Several types for use with different styles of spindles.

Sleeves of new lapless construction . . . last longer . . . do not ravel . . . can be run in either direction.

R. G. HASKINS CO.
4654 W. Fulton St.
Chicago

HASKINS Equipment is ***standard*** equipment in hundreds of industrial plants.

Heavy duty, countershaft type of equipment.

SAVINGS That Show!

WELLS Metal Cutting BAND SAW

- **Reduces Cutting Time**
- **No Coolant Required**
- **Cuts Any Metal**
- **Extreme Precision**

FROM 30 to 50% in cutting time can be saved with the Wells Band Saw. Hundreds of duplicate pieces can be cut without showing a variation of .005" in thickness. Used in tool room or maintenance work—or for quantity production where extreme precision is demanded—savings made in time and labor costs soon cut an attractive figure. Look into these advantages. Send for the descriptive folder today!

DEALERS WANTED

Wells Manufacturing Corp.
THREE RIVERS, MICHIGAN

Handy

BALL BEARING GRINDERS

a real value for $25.00

½ H. P. 3450 R. P. M. 7"x⅝" wheels

Equipped with BALDOR Motor

WRITE FOR BULLETIN

Heavy Duty

Precision-built

Guards are removable for Buffing duty.

GUARANTEED ONE YEAR

MAIL COUPON —

We'll send complete information on all "HANDY" Grinders (6" to 12"—1/6 h. p. to 3 h. p.) and name of nearest distributor

BALDOR ELECTRIC CO.,
4368 Duncan Ave.,
St. Louis, Mo.

TEAR OUT MAIL TO-DAY

Send latest Bulletins, and prices of "HANDY" Grinders, at once.

FIRM .....

STREET .....

CITY & STATE .....

WYCO FLEXIBLE SHAFT EQUIPMENT

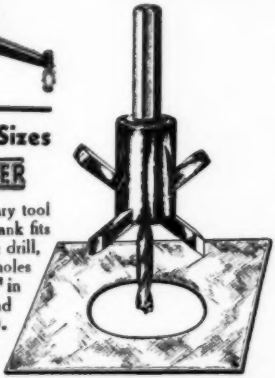
Compare Quality! — Compare Price!

Something New in Flexible Shaft Design

Guaranteed quality and performance—at a lower price! WYCO Flexible Shaft machines range in size from 1/4 h.p. single and multiple speed machines, to heavy duty sizes complete with full equipment. Ask your jobber for complete information or write to us.

Now Made in Two Sizes

WYCO HOLE CUTTER



Quickly adjustable. A necessary tool for any shop. The hexagon shank fits 1/2" drill chucks on any electric drill, drill press or brace. Cuts round holes from 7/8 to 2 1/2" and 1 3/4 to 4 1/2" in diameter. Complete with bits and pilot drill **$2.50** and **$4.50.**

ASK your jobber for a Catalog of the Profit Producing WYCO Line!

WYZENBEEK & STAFF, INC.
642 W. Washington Blvd., Chicago, Ill.

FOOTBURT

A Single Spindle Footburt Sipp Sensitive Drill

Made in three sizes of single and multiple spindle models

More holes with this machine

Why? Because you can change speeds in two seconds or belts in ten seconds—because the automatic idlers keep the belt pulling to capacity at all times—because the full ball bearing equipment and accurate machining gives a smooth, fast cut.

Write for No. 650 Folders

The Foote-Burt Company, Cleveland, O.

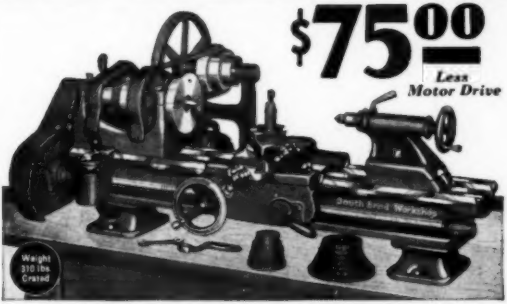
FOOTBURT

This New 1936 Model Genuine South Bend

LATHE

$75.00

Less Motor Drive



9½" x 3' Workshop Bench Lathe with Horizontal Countershaft, ¼ h.p. reversing motor and switch, and belting as shown. **$98.25**

This New 1936 model 9" x 3' Workshop Bench Lathe is a back-geared, screw cutting precision lathe, capable of handling the finest, most accurate jobs in manufacturing, in the tool room and laboratory.

Lathe may be fitted with draw-in chuck and collets, grinder, taper attachment, milling attachment and 34 other attachments for all machine shop operations.

Write for Catalog 15-R
Shows this lathe in eight different drives and four bed lengths. ***Sent Free.*** **Easy Payments. Terms if desired.**

SOUTH BEND LATHE WORKS
192 E. Madison St.,
South Bend, Ind., U.S.A.

FREE! 24 Page Book

SOUTH BEND *Precision* LATHES

WHEN a wrench is specified as equipment — particularly when the equipment goes to sea — the wrench must be entirely fool-proof and rugged.

THE LOWELL BRIDGE BUILDERS WRENCH

is furnished as an emergency reversing lever on a well known Diesel Engine as shown in the illustration above. Once a LOWELL is on a shank or shaft it stays there until the work is done—all the operator does is *pump*. And it's STRONG—a two-foot LOWELL WRENCH will successfully resist a straight pull of over a ton!

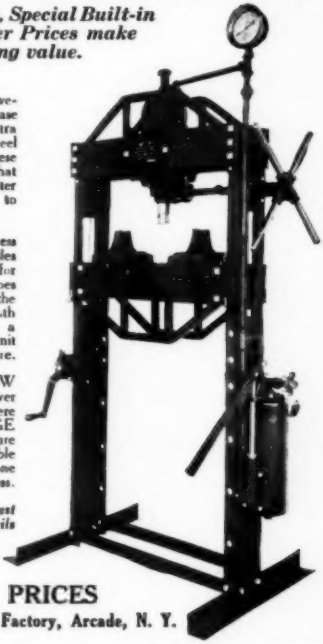
Write Today for Catalog Showing Complete Line of LOWELL Heavy-Duty Wrenches

LOWELL WRENCH CO.

WORCESTER, MASSACHUSETTS, U. S. A.

KRW Hydraulic and Sensitive ARBOR PRESSES

New Improvements, Special Built-in Features and Lower Prices make them an outstanding value.



THE last word in convenience, efficiency and ease of operation. Built extra strong and well braced, with steel trusses electrically welded, these presses will withstand strains that would cause presses of lighter and inferior construction to buckle or collapse.

Hand wheel for sensitive press operations has sliding handles which pull out to the ends for increased leverage. Work does not have to be changed from the work table as is the case with other make presses having a separate sensitive press unit mounted on the side or elsewhere.

The importance of this K R W feature as a time and labor saver can be appreciated. Also there is NO EXTRA CHARGE for this important built-in feature on a KRW Press. Work table can be raised easily with one hand. A strictly one-man Press.

Write for special circular, just off the press, giving full details and specifications of all KRW Arbor Presses.

PRICES

F. O. B. Factory, Arcade, N. Y.

No. 37—35 ton Hydraulic and Sensitive Arbor Press	$135.00
No. 37E—50 ton Hydraulic and Sensitive Arbor Press	164.00
No. 37F—70 ton Hydraulic and Sensitive Arbor Press	275.00

Gauge and fittings, $15.00 extra on all presses.

K. R. WILSON

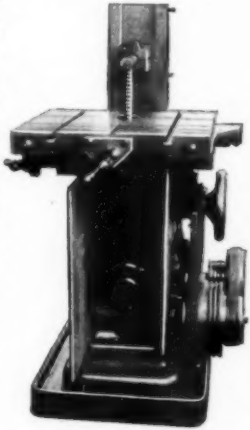
10-16 Lock Street, Buffalo, N. Y., U. S. A.

EXPORT DEPARTMENT
90 West St., New York, N. Y.

WEST COAST BRANCH
722 Mateo St., Los Angeles

HACK UNIVERSAL MACHINE COMBINES ALL OPERATIONS OF DIE MAKING

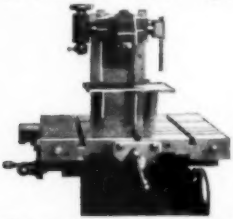
To meet the need for a machine to do all the mechanical and most of the hand operations required in the die making industry, Frank W. Hack, Chicago manufacturer, has developed a universal machine that is unique in its field.



Cut shows machine with upper and lower arm supporting broach screw feed to broach.

Designed and built to eliminate the waste of time entailed in setting up and tearing down one machine after another, the Hack universal die-making machine carries attachments to do every kind of work likely to be called for in making dies, molds or metal patterns.

Attachments for horizontal and vertical boring, horizontal and vertical milling, surface, cylindrical and bore grinding, heavy and light sawing, heavy and light filing, radial drilling, shaping, slotting and keyseating, jig sawing and other processes are interchangeable and may be fitted or exchanged by one man in a few minutes.



Picture shows the 3-in-1 head—collet holder, broach holder and shaper head.

With the facilities to do substantially all operations on one machine the mechanic need not leave the locality of his bench, and the time normally wasted in trips from the bench to dis-

(Continued on Page 24)

Why Bother to Change Dies ?

No. 65R, ratchet.
No. 65, plain die, 2 handles.

This RIGID Threads 4 Sizes of Pipe With 1 Set of Dies

Spin up workholder, slide setting post to size pipe you want to thread, 1" to 2"—and this tool is ready to cut a clean true thread—no bother of changing chasers.

This new 65R RIGID die stock *really does it.* But it also has a workholder you'll like—sets to size by a twist of the gauge ring and tightens with ONE screw.

These too: thumb lever that releases dies from threads when backing off, reversing ratchet by same turn. Straight line action, no cock or wabble. Maximum chip room, enclosed parts. Plenty of strength, but lightest, neatest die made. ***Ask your jobber.***

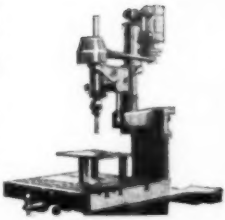
Famous RIGID wrench now made of double strength alloy, jaws, handle, housing. Meets U. S. Govt. specifications and Navy tests.

The Ridge Tool Co., Elyria, Ohio, U.S.A.

RIGID Reg. U. S. Pat. Off.

Pipe Wrenches, Cutters, Threaders, Vises, Extractors.

tant machines, in locating tools, cleaning up and transporting parts is turned to productive work. Since the actual machining time on most die work is but a small fraction of the total time consumed in doing the job, the Hack machine, it is claimed, effects a considerable saving in labor cost.



Showing the drilling attachment and elevated table.

The machine is made in two sizes, and according to the manufacturer, is not limited to die making, but will also do other production work efficiently. Numerous new features are incorporated in the design, among them a reciprocating vertical rear ram which serves as a stationary support and as a support for motor driven heads.

To facilitate the rapid conversion from one type of machining to another required the ingenious application of mechanical principles to obtain rigidity and power on one hand and sensitiveness and speed on the other.

Further information may be obtained by writing directly to the manufacturer, the Hack Universal Die Making Machine Co., 440 North Oakley Blvd., Chicago, Ill.

GROB ANNOUNCES TWO NEW BAND SAWS

Research activity in the plant of the Grob Brothers, West Allis, Wisconsin, is evidenced this month with the announcement of two new band saws.

One of the new open-end saws, known as type OS 20, uses a saw band 140 feet long, helically wound on an aluminum drum. Instead of the conventional tapered drum with a flat surface, this saw employs a cylindrical drum having a threaded groove with a tapered bottom.

To maintain proper spring tension on saw bands of different sizes, only one guide pulley is used above the saw table. This pulley is raised and lowered with a lever.

(Continued on Page 26)

The New 1-B, 1/4" Capacity (5/16" Chuck)
2-B, 3/8" Capacity (1/2" Chuck)

Replacing the No. 1 and 2 ETTCO Tappers

Ettco-Emrick

TAPPING ATTACHMENTS

Here's Speed, Long Life and Satisfactory

SENSITIVE TAPPING

Here's fifteen years experience with the old No. 1 and 2 wrapped right up in efficiency.

The BALL BEARING SPINDLES and Needle Bearing quills, with all HELICAL GEARS tell their own story.

The NEW LEATHER CLUTCH in the form of shoes or segments just about doubles the clutch life.

And besides—there is that ideal about a leather clutch, for medium tapping, for which we have found no substitute.

THE TAP IDLES "IN"—NOT REVERSE. It's about time somebody incorporated this tap and work saving feature,

Write for New Bulletin covering all seven sizes of ETTCO Tappers

ETTCO TOOL CO.

596 Johnson Ave., BROOKLYN, N. Y.

Both pulley and drum have a diameter of 20 inches, permitting the use of thicker bands and the cutting of sharper curves.

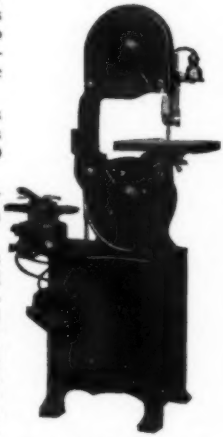
Other improvements of this model include a saw table which tilts in two directions, adjustable saw guides and a feeding device operated by gravity, which prevents too-fast feeding and bumping of the work against the saw blade. A limit switch is so arranged that the saw band cannot be reversed until the feed has been released.

A newly-developed clamp which will hold securely any shape of die block permits feeding in curves and also makes it possible for the operator to follow a straight line more accurately.

Two ¾ h.p. electric motors provide four cutting speeds and a reverse speed of 500 feet a minute.

The machine is completely guarded with swinging doors and removable covers.

Another new Grob machine is a metal band saw for external and internal sawing. For internal sawing any standard metal band with a width of ⅛" to ½" is inserted and joined on a conveniently-mounted brazer. A special grinder is furnished with the machine to grind the weld to proper thickness.



GROB METAL BAND SAW

Three speeds are provided by means of a three-step pulley mounted on a floating motor. Two V-belt compound-reduction drive pulleys are mounted directly on the base of the machine. Adjusting screws are so located that the V belts can be tightened from outside the machine.

The band saw has a throat of 14" and the size of the table is 14"x14". For further information, write Grob Brothers, West Allis, Wisconsin.

Patented

By Stacking in

STACKRACKS You Save Space, Time and Labor

The STACKRACK is just the thing on your assembly floor, in your machine shop, under workbenches for perfect "stock control". With STACKRACKS you will be able to stack materials at the point where they are the most needed without wasting valuable space. And besides they will eliminate the "stockroom parade" which is wasting employees' time.

With the STACKRACK boxes and pans are always in an orderly arrangement—neatly stacked one on top of the other—each unit being completely accessible without disturbing other units. STACKRACKS are made in single units each constructed of angle and formed steel, welded together. Each rack automatically locks in position on the rack underneath.

Don't pass up this opportunity to learn how you can better your storage problems by using STACKRACKS for greater plant efficiency.

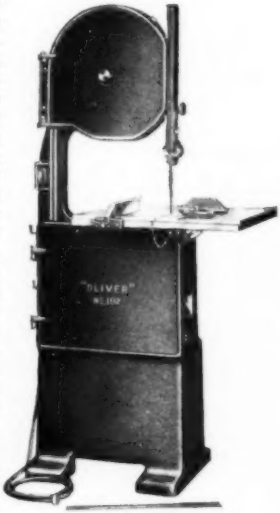
P. S.

When writing be sure to specify sizes of boxes to be stacked and approximate weight of contents.

STACKBIN CORP.

PROVIDENCE, R. I.

NEW OLIVER BAND SAW CUTS SHEET METAL IN CURVES



Long established as manufacturers of wood-cutting band saws, the Oliver Machinery Company, Grand Rapids, Mich., have announced a new 18-inch portable metal-cutting band saw with all the refinements of larger Oliver models.

Demonstrated at the Foundrymen's convention at Detroit during the first week of May, the new saw attracted considerable attention by its ability to cut curves and irregular lines as well as straight and revealed an excellent adaptability for experimental and laboratory work, where sheet metal must be cut in irregular forms.

This Oliver band saw is a self-contained, portable machine, regularly fitted with motor-on-shaft, cord and switch. A special feature is the large cast iron table with miter cut-off gauge and parallel cutting fence. The table tilts 45 degrees to the right, and the saw accommodates saw bands up to ½ inch wide.

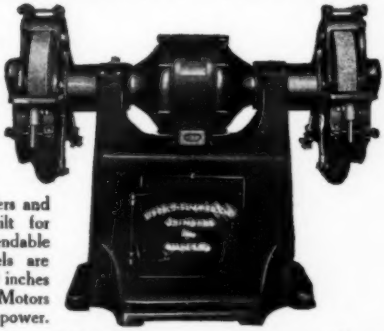
This band saw has a space of 18 inches between saw and column and 9 inches under the upper guide. With gauges in use, it will cut parallel up to 11 inches wide and will cut off and miter up to 6½ inches. The wheels are of cast iron, 17 inches in diameter, with a 1¼ inch face, covered with rubber. Both wheels are completely guarded with machined cast iron doors or guards, and the rear part of the saw band is also completely enclosed.

(Continued on Page 30)

Marschke Grinders and Buffers

Made in all sizes and types

Send for Catalog



Marschke grinders and buffers are built for years of dependable service. Wheels are 10 inches to 30 inches in diameter. Motors are 1 to 25 horsepower.

Vonnegut Moulder Corporation

1805 Madison Avenue, Indianapolis, Ind.

SpeedWay

Proved Performance Ends Tool Gamble

Built on proved lines, embodying definitely established principles of designs, crash-proof steel bodies (lighter, handier) air-cooled (saves motor), over-powered (will not stall on tough jobs) and 12 other features that mean more holes per dollar and longer, trouble-proof service. A full line to pick from.

WRITE FOR CATALOG

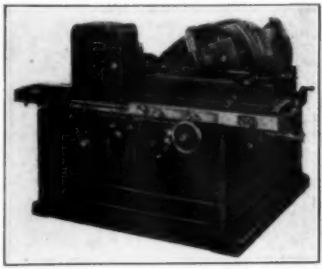
SpeedWay Manufacturing Co.

1822 So. 52nd Ave., Cicero, Ill.

Motor is 1 h.p. enclosed type, fitted with ball bearings, and operates at 1800 r.p.m. on either alternating or direct current of 110 or 220 volts from any light socket.

NEW UNIVERSAL PRECISION THREAD GRINDER

Ex-Cell-O Aircraft & Tool Corporation of Detroit, Michigan, announces a new universal precision thread grinder with a capacity for grinding external threads 8" in diameter, 24" long, on a maximum length work piece of 33" between centers. The machine is also adapted for grinding internal threads on work having threads not smaller than 1" in diameter, 1" long, up to 8" diameter, 3" long. U. S. Standard form, sharp "V", 29 degree Acme, up to and including 60 degrees thread form and modified Buttress threads with single, double, triple, quadruple or sextuple threads within the range of pitches from one to 40 can be ground on this machine. Tapers up to two inches per foot included angle can also be ground. A lead tolerance of .0002" per inch when grinding U. S. Standard form threads can be maintained.



The machine is automatic in all its grinding operations except for loading and unloading the work and withdrawing the grinding wheel at the end of the cut. It will grind to a predetermined size setting and then automatically stop feeding; or it may be set so that the table will stop at either end or at any point of its travel.

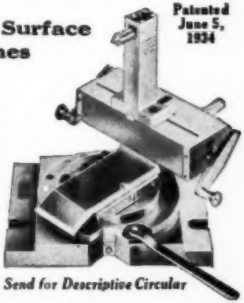
A variable high speed control is used to adjust the rapid approach speed of the work to the grinding wheel in either direction of spindle rotation or table travel.

(Continued on Page 32)

The Vinco Angle Tangent to Radius Dresser

For

External, Internal and Surface Grinding Machines



Patented June 5, 1934

The Vinco Angle Tangent to Radius Dresser will dress angles and radii tangent to each other on abrasive wheels for less than 25% of any other method. It is the only Angle Tangent to Radius Dresser on the market, and is an absolute necessity for the accurate and economical dressing of forms on Abrasive Wheels. This Dresser has eliminated waste, worry and inaccuracy in many tool rooms throughout the U. S. A. and Canada. It is precision made of the finest materials and fully guaranteed to be satisfactory.

Send for Descriptive Circular

VINCO TOOL CO., 7348 Central Ave., Detroit, Michigan

HIGHER QUALITY **FAMCO** LOWER PRICES

ARBOR PRESSES

½ to 12 tons

FOOT (KICK) PRESSES

3 in.—6 in.—10 in.

AT YOUR DEALER'S, Or Write for Descriptive Literature to

Friis & Miller Machine Co.

RACINE, WIS., U. S. A.

(Manufacturers)

Individual spindle speed adjustments are provided for each direction of table travel or spindle rotation, and are used as work speed adjustments for controlling the speed of the work while grinding. A lead compensating device corrects the lead error caused by taper setting. A hydraulically controlled backlash compensating device for compensating the lead screw and gear backlash is also provided. A back-off attachment can be furnished with the machine with capacity up to 18" length work. The hydraulically operated wheel dresser is operated from the front of the machine.

The grinding wheel spindle is equipped with Ex-Cell-O precision ball bearings. A three horsepower totally enclosed ball bearing driving motor and wheel spindle are mounted in a cradle that can be adjusted so that the grinding wheel will grind up to 30 degrees to suit the helix angle of right-hand threads and up to 45 degrees for left-hand threads.

On a separate rubber cushioned base, located at the rear of the machine, are mounted the hydraulic pump, oil filter and three-horsepower totally enclosed ball bearing electrical drive motor. Coolant is furnished to the work by a vertical type centrifugal pump with direct connected electrical motor, mounted on the removable coolant tank located in the base and at the rear of he machine.

All controls for the machine are located on the front of the machine on a control panel. Manual controls are also provided for use independently of the automatic controls.

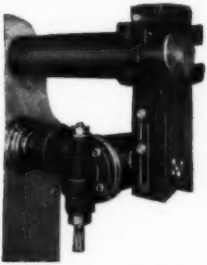
NEW BOOKLET ON STAINLESS STEELS

Peter A. Frasse & Co., Inc., have published a new booklet on the fabrication and treatment of USS stainless and heat-resisting steels.

Written by D. C. Buck, member of the Frasse Stainless Steel staff, the booklet contains a summary of the latest information on the USS stainless steels, carefully indexed, and is designed as a practical help to the engineer and the shop foreman.

Those interested may obtain a copy by writing to Peter A. Frasse & Co., Inc., 17 Grand St., New York City.

VERTICAL SPINDLE MILLING ATTACHMENT



Furnished with No. 10 Brown & Sharpe Taper

S. K. F. Double-row Ball Bearings

The ABLE rigid, ball-bearing drive, vertical-spindle milling attachment fits any milling machine by means of an adjustable-slide suspension support. It can be used for milling, drilling and boring at any angle and in both directions without disturbing the set-up of the work. The main spindle, which is precision-ground, runs on S. K. F. ball bearings with Brown & Sharpe No. 7 taper. Speed ratio is 2 to 1. Motion is reversible for left hand cutters. All nuts and bolts are hardened. Price, $150.

We also manufacture the ABLE universal swivel vise

ABLE Products Machine & Tool Works, Inc.
20 West 22nd Street, New York, N. Y.

CIRCULARS ON TRACER POINTS AND A NEW BENCH MILLER

Two handsome circulars issued recently by Pratt & Whitney, division of the Niles-Bement-Pond Co., will prove interesting to manufacturers using milling and profiling machines and to machine operators generally.

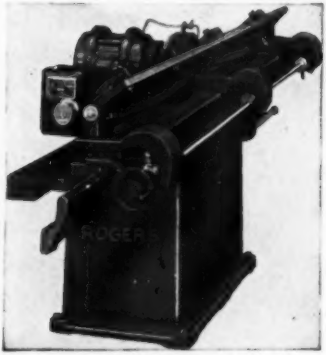
The first, titled "Milling Cutters and Tracers for Keller Machines" illustrates in large-scale photographs many new types of milling cutters and tracer points, together with brief explanations of their uses and listings of standard sizes.

Manufacturers and dealers interested in the latest practice in this type of production may obtain the circular by asking for No. 421.

The second circular, also profusely illustrated with photographs, shows the new Pratt & Whitney bench miller engaged in various standard shop operations and illustrates its versatility and capacity for milling and machining work. A copy of the circular, which is known as No. 422, may be obtained by writing to the Pratt & Whitney Co., Hartford, Conn.

SHARPER KNIVES at LOWER COST

plus these added Advantages



Rogers Knife Grinder

- No delays — Sharp Knives ready when you need them
- Increased Production with Sharper Knives
- Longer Life to your Cutting Machinery
- Sharp Knives mean Less Power Consumption
- Improve the Quality of your Product

Send Length of Knives for Complete Details

We also make
SAW SHARPENERS

SAMUEL C. ROGERS & CO.
181 Dutton St.
BUFFALO, N. Y.

SUPREME *Super-Duty* SHEAR BLADES

Poorly finished, inaccurate shear blades waste set-up time, cause needless changing and regrinding and are short lived. For these reasons it will pay you to specify **SUPREME** Shear Blades as *precision* plays an important part in their manufacture.

are made to order to suit your requirements—for any make of Shear. They are manufactured in Laid Alloy and High Speed Steel, as well as Solid Steel.

Let us quote you on your shear blade requirements.

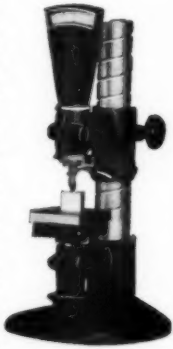
Certain territories open now for responsible dealers

The Saw & Knife Specialty Co., Inc.

Saws—Machine Knives—Tools

6526 Carnegie Ave., Cleveland, Ohio

WEBBER SIZE CONTROL SYSTEM DEVELOPS WEBBER COMPARATOR



A comparator having a work range of 0 to 6 inches, with a measuring accuracy of .00001 of an inch, developed by the Webber Gage Co., achieves remarkable accuracy with a relatively simple operating mechanism.

Construction of the comparator is based on the principle of the simple lever and includes only two moving parts, a vertical spindle and a horizontal beam which carries the indicating hand. A stationary knife edge supports the horizontal beam, and a second knife edge, held in place by a spring tension of 1/60 ounce pressure, rests on the beam on the upper side, thus guarding against accidental bumping of the spindle. The knife edges are adjusted at the factory to give any desired amplification and once sealed cannot get out of adjustment. Any slight wear is taken up by the spring pressure of the knife edges against the horizontal bar.

The spindle may be lifted 1/32 in. to clear the work, or the work may be pushed under the spindle from any direction without fear of damage to the knife edges or to the contact point. The contact point is a steel ball which may be inexpensively replaced when it is worn. Diamond contact points may also be supplied.

Coarse adjustment is obtained with a collar (see illustration) around the column which supports the head and which prevents the head from being dropped accidentally on the work.

Fine adjustment is obtained by raising or lowering the table by means of a knurled collar near the base of the instrument.

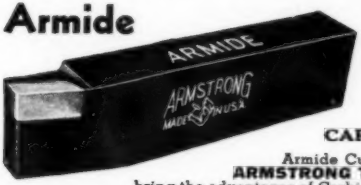
Choice of three scales is provided, in graduations of 0.0001, 0.00005 and 0.000025 in. Measuring error is less than 0.00001 in. The scales are translucent and are

(Continued on Page 38)

ARMSTRONG

TRADE MARK REG. IN U.S. PAT. OFFICE

Armide Cutters



CARBIDE TIPPED

Armide Cutters for standard **ARMSTRONG TOOL HOLDERS:** bring the advantages of Carbide Cutting Tools to every shop. On Armide Cutters less than an ounce of Carbide does the work of many ounces on bar tools. Armide Cutters come ready-ground to standard cutting shapes . . . can be bought from your nearest mill supplier. They are recommended for machining the hardest and toughest steels, for production and semi-productions runs where they hold their edge up to 100 times as long as steel.

Write for Circular

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

308 N. Francisco Av., CHICAGO, U.S.A.

DRILLING MACHINES

SIZES

Stationary Head—14"-20"-21"

Sliding Head — 24"-28"-32"-36"

These machines were formerly manufactured by the Rockford Machine Tool Company of Rockford, Illinois. Thousands of these machines have been installed and are giving universal satisfaction.

Also manufacturers of the Cleereman Automatically Oiled, Anti-Friction High Speed Drilling, Boring and Tapping Machines.

Builders of drilling equipment for over twenty years.

CLEEREMAN MACHINE TOOL COMPANY

Green Bay, Wisconsin

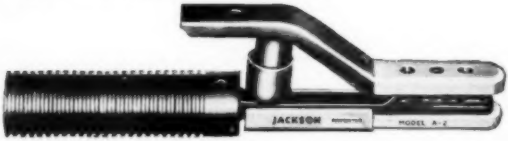
[Formerly Green Bay Barker Machine & Tool Works]

easily read whether the light comes from the front or the rear of the instrument. If desired, a miniature lamp may be installed behind the scale and a small transformer built into the base of the instrument.

A dovetail slide built into the table accommodates special fixtures for special jobs. If necessary for unusual work, the head may be used in a horizontal or inverted position. Height overall is 18 inches. Weight is 45 pounds.

Inquiries from readers should be addressed to the Webber Gage Co., 2519 Vestry Ave., Cleveland, Ohio.

NEW ELECTRODE HOLDER

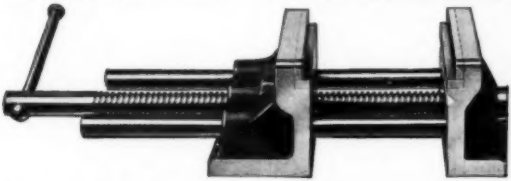


At least 90% of the flashes in welding are caused by contacting the ordinary bare type electrode holder with grounded parts. To eliminate such flashes, to provide a maximum degree of safety for the operator and protection for the work and to provide longer and more economical holder service, the Jackson Electrode Holder Co., 6553 Woodward Avenue, Detroit, Michigan, is introducing a new model embodying radical improvements in design.

The new holder, like previous Jackson holders, is completely insulated and air cooled. Total weight of the Jackson holder is about that of bare type holders of comparable capacity. A special copper alloy has been adopted for the structural parts of the holder, combining strength with adequate conductivity.

Since the jaws of any holder are the parts first to burn out, this new holder is provided with replaceable jaws of Mallory 3 Metal, a copper alloy that is already widely used for spot welding tips, flash welding dies and seam welding wheels. It combines the tensile and elastic properties of structural steel with the high electrical conductivity and corrosion resistance of pure copper. This jaw construction has unusually long life and, when jaws ultimately become worn, replacement is simple, easy and economical, adding indefinitely to the life of the holder.

A Drill Press Vise
—with—
Built-In Parallels



No interference from chips or burrs; can be used from three sides. Save time and reduce costs on drilling operations. Two inches clearance for through drilling. ***Send for illustrated circular.***

NATIONAL MACHINE TOOL CO., Racine, Wis.

ACE SPOT WELDERS

Cut Manufacturing Costs

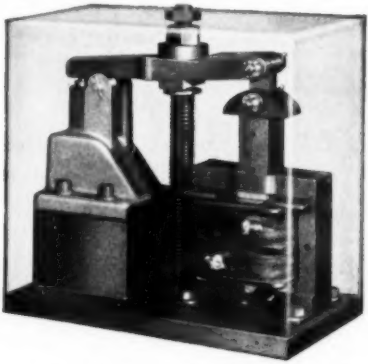
Eliminate Bolts and Rivets

Write today for information on how an ACE spot welder will help you to cut costs of labor and materials. Learn how these modern, efficient machines will save time and money in your plant by replacing old methods!

Send right now for sample welds and prices!

PIER EQUIPMENT MFG. CO.
608 Cross Street, Benton Harbor, Mich.

NEW SOLENOID AIR VALVE



A new solenoid controlled straightway air valve has been introduced for which the manufacturer claims distinct advantages, due to its heavier design and the ruggedness of its construction. It is particularly intended for the severe service of production plants—for instance, as a by-pass, tying in with other operations where pressure in a cylinder must be regulated, a function which of course cannot be performed by an operating valve.

Other applications include the maintenance of constant fluid levels in tanks in connection with floats, remote control of air whistles for locating executives who are absent from their usual posts and in welding machine operation, where it is desired to move the piston in the air cylinder at a very slow rate of speed through low pressure, the piston (upon reaching the end of its stroke) exerting full line pressure through energizing the solenoid on the straightway valve.

This new valve, which can be furnished for either normally open or normally closed service, is manufactured by the Ross Operating Valve Co., Detroit, Michigan, specialists in valves for the control of single and double-acting air cylinders.

VISE

For DRILL PRESS

Often used on Miller, Shaper, Planer

6", 9" and 12" Jaws

Fig. 2
Without Jig Attachments

With Jig Attachments, much duplicate drilling without special Jig cost.

KNURL HOLDER

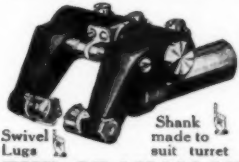
For Turret Lathes

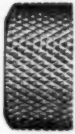
Operates like Screw Die

Adjustable to any size within its capacity.

TWO SIZES — TWO STYLES

Straight Cut Knurls in Swivel Lugs Produce all Standard Knurling.





Send for Circulars

THE GRAHAM MFG. CO., 70 Willard Ave., PROVIDENCE, R. I.

OLIVER of ADRIAN
Die Making Machines

—save 50 to 60% of the labor on all sawing, filing and lapping operations. Saw to the die outline from advantageous starting points, thereby eliminating unnecessary sawing.

No saws to braze or special parts to buy.

Machines available for all classes of work in materials up to 3" thick and at a price within the reach of every shop.

Send for Oliver literature today; there is no obligation.

OLIVER INSTRUMENT COMPANY

1408 Maumee St., ADRIAN, MICHIGAN

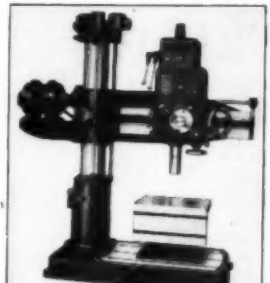
HORAT MOLD RENEWS SOFT HAMMERS

Appreciable savings in replacement expense are claimed for the soft hammer mold illustrated here.

Soft hammers are used in finishing steel, brass, aluminum and copper parts when it is essential that no nicks spoil the finish, and are usually made of brass, copper, or other soft metals, with the result that they themselves quickly become dented and battered.

The advantage claimed for this mold, manufactured by the J. Horat Mfg. Co., Lafayette, Ind., lies in the fact that it makes hammers of inexpensive babbitt and lead, which can be melted and re-cast when the hammer is battered with use.

MORRIS MOR-SPEED RADIAL DRILLS COMBINE SPEED WITH SIMPLICITY



The illustration above shows one of the new Morris Mor-Speed radial drills, developed by the Morris Machine Tool Co., Cincinnati, Ohio.

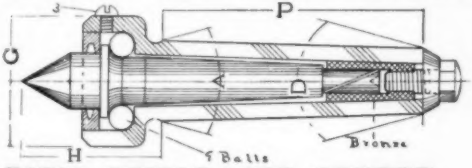
Built for high-speed drilling, facing, boring and tapping, these machines are noteworthy for the ease with which they are operated and controlled. Automatic stopping devices and feed-clutch releases, together with direct-reading dials and one-lever controls for raising, lowering and clamping the radial arm assure ease and rapidity of action.

All lubrication of speed and feed change mechanism is automatic. Motor-driven lubricating pump operates at constant speed, and both flow of oil and oil level

(Continued on Page 44)

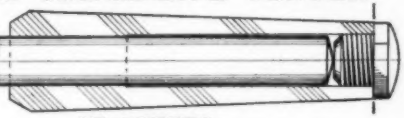
RIGID RESILIENT LIVE CENTER

DESIGN



RIGID TRIPLE-LIFE CENTER

GREAT ON GRINDERS



IT OFFERS:

Long Life & Short Overhang

v s

Short Life & Long Overhang

Saves 1/3 on initial tool; 2/3 on subsequent Inserts.

Rigid Tool Holder Co., 12281 Turner Ave. Detroit, Michigan

Gem Drill Press Vises

No. 1 Vise

Price $18.00

Made of Malleable Iron.

Tool steel jaws with "V" grooves and accurately ground.

Length over all	12"	Depth of jaws	2"
Width	4½"	Jaws open	3½"
Height	4"	Weight	18 lbs.

We also manufacture larger vises

Circular on request

J. E. Martin Tool & Die Works

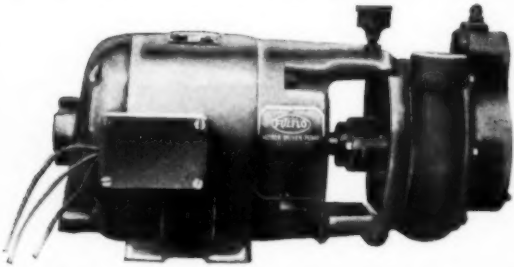
518 W. State St., Springfield, Ohio

are indicated by sight gauges.

Centralized control, with every lever within easy reach of the operator, and ball bearing mountings for drill head and radial arm contribute to the effortless control of this machine. Ground gears, anti-friction bearings and rigid construction produce smooth, quiet operation.

Reversing motor is mounted on the rear of the arm to balance the machine and to avoid moving the motor. Reversing switch is conveniently mounted in the head. A magnetic reversing switch located in the rear of the arm protects the motor from overload and undervoltage.

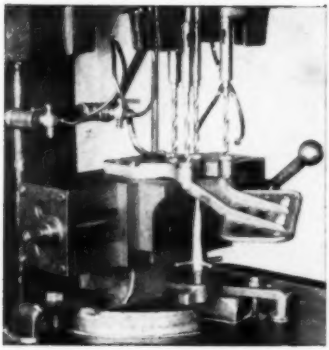
FULFLO CENTRIFUGAL WATER PUMP HAS NEW, MODERNIZED DESIGN



Following in the trend toward compact, streamlined styles and accessories, the Fulflo Specialties Company, Blanchester, Ohio, has brought out its new AG3-M centrifugal water pump, shown in the illustration. This unit is modern in design, construction, and performance. Wear on the motor shaft is eliminated by means of a hollow hardened replaceable steel impeller shaft which slips over the end of the motor shaft. Spring tension packing eliminates adjustments and keeps the packing tight at all times.

The standard unit is supplied with a cast-iron body, a bronze impeller, and a priming cover, as shown in the illustration. A straight cover can be supplied when gravity feed is used; this is optional with the user.

Power is supplied by a ¼ h.p. splashproof ball bearing motor at 1725 r.p.m. The pump delivers 25 gal. a minute at a 10 foot head.



"JOHN'S" UNIVERSAL DRILL JIG

Jaws and bushing plates are all you need to make your permanent drill jigs.

The "John's" Jigs provide a base with quick clamping action for an unlimited number of drill jigs — thereby cutting future jig cost 75% in most cases.

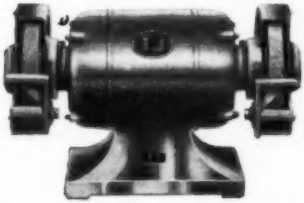
MADE IN 3 SIZES

Write for Literature

HEUSER MANUFACTURING CO.

1638 N. Paulina St., Chicago

A Heavy Duty VALLEY Ball Bearing ½ H. P. BENCH GRINDER AT $35.00



Full ½ H. P. motor 3450 R. P. M. Oversize Ball Bearings mounted in dust tight housings. Repulsion-Induction Single Phase Motor (Not Split Phase). Can be attached to any light socket. Fully guaranteed.

Equipped with two 7" dia. x 1" face wheels (Not the usual ¾" face wheels). Substantial base with cord and plug and switch in base.

VALLEY ELECTRIC manufactures a complete line of Bench, Pedestal type Buffers and Grinders. ¼ H. P. to 7½ H. P.

VALLEY ELECTRIC CORPORATION ST. LOUIS, MISSOURI

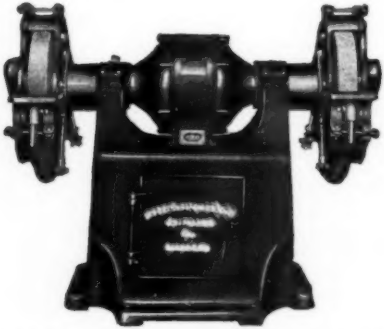
***Mfrs.* of Ball Bearing Motors ¼ to 40 H. P.**

HOLO KROME PUBLISHES BOOKLET ON SCREW STANDARDS

A booklet published by the Holo Krome Screw Corporation of Bristol, Conn., contains the standards for hexagonal type socket sets and cap screws as approved by the American Standard Association, February, 1936. This booklet including all dimensions of heads, bodies, screw and thread lengths, screw points, socket and wrenches, has been sponsored by the Society of Automatic Engineers, and the American Society of Mechanical Engineers.

Designers, engineers and draftsmen wishing for a copy of this complete tabulation of screw standards for reference may have one free of charge by writing Holo Krome Screw Corporation, Bristol, Conn., H.K.166.

VONNEGUT MOULDER CORP. TAKES OVER MARSCHKE GRINDERS AND BUFFERS

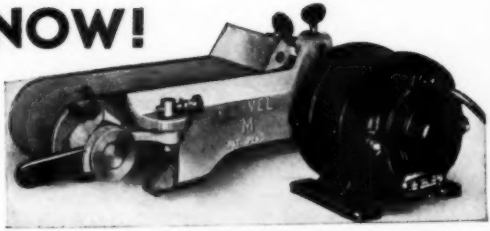


The Marschke line of electric buffers, floor stands and swing frame grinders, until recently offered through a division of the Van Dorn-Black and Decker organization, is now being manufactured and sold exclusively by the Vonnegut Moulder Corporation, Indianapolis, Ind.

Twenty-five years of continuous development and the recorded performance of more than 5,000 Marschke ma-

(Continued on Page 48)

NOW!



An Inexpensive

ABRASIVE BAND GRINDER—

"Built Like A Machine Tool"

The Hormel-M Grinder is sturdily built with a supporting leg under the grinding table to eliminate vibration and tipping due to pressure on belt. Ball bearing throughout, equipped with Alemite lubrication, complete with grease gun. ***Write for illustrated folder on this and other styles and sizes.***

HORMEL-M GRINDER

WALLS SALES CORP., 96 Warren St., New York, N. Y.

"ALNOR" Pyrometers

For every requirement

Inexpensive-accurate-durable

For over 15 years "Alnor" pyrometers have been the choice of thousands of both large and small shops everywhere. Because of their lower price and compact size they are extensively used for indicating temperatures of molten lead, babbitt, tin and die cast metals, heat treating furnaces, for flue gas temperatures, and similar service. Also other types of portable and wall pyrometers for every requirement.

$13 to $36 and up
depending on type and application.

Write for Information.

Illinois Testing Laboratories, Inc.

150 W. Austin Ave., -:- -:- Chicago, Ill.

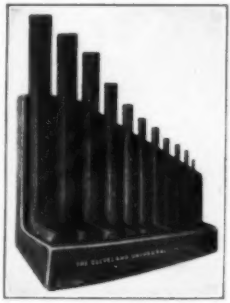
35 Year's Experience

chines in the United States and abroad have proved the efficiency and dependability of these tools, and the combined experience of the Van Dorn Electric Tool Co. and the Black and Decker Mfg. Co. produced a wide variety of sizes.

Marschke grinder and buffers are now made in many styles for wheel sizes from 10 inches to 30 inches in diameter and with motors ranging from 1 to 25 h.p. Additional information may be obtained by writing to the Vonnegut Moulder Corp., 1805 Madison Ave., Indianapolis, Ind.

NEW SOCKET WRENCH HOLDER

Time consumed in looking for necessary tools often is a serious factor in any machine shop or tool room. This is especially true of the special wrenches used for setting up or loosening socket head set screws.



To eliminate this idle time, the Cleveland Universal Jig Company, 13328-13404 St. Clair Ave., Cleveland, Ohio, recently developed the device illustrated herewith, which consists of a molded rubber composition base with a separate receptacle for each wrench. These bases are made in two sizes. The larger size accommodates 11 wrenches from 3/32 to 5/8-inch across the flats and is designed for general machine shop use, especially on repair and assembly operations. The smaller set designed for toolmaker's use accommodates eight wrenches, ranging in size from 3/32 to 3/8-inch across the flats.

As the illustration shows, the design of the base is such that the wrenches locate at a slight angle so they will always remain in place, but at the same time the size desired is picked out instantly.

Through experimentation with bases of various materials, cast iron, aluminum, bronze, etc., it was found that the rubber composition was the most practicable, as it is not easily broken, and also will not mar anything with which it comes in contact.

HUNDREDS OF APPLICATIONS
THOUSANDS IN USE —

Wrigraph
PRECISION DRAFTING MACHINE

Sizes Up To 20"x26"

WRIGRAPH—guaranteed accuracy, instrument workmanship. Brief case and drawing room models. Interchangeable drawing attachments to suit your drawing needs. Each unit is complete with a board and paper clamps. A compact machine for all drawing purposes.

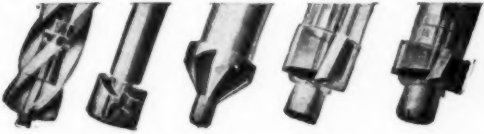
Junior machine complete as illustrated with 10x12" board; parallel device special triangle and paper clamps $5.

Write for literature and prices on Larger Models

L·G·WRIGHT, INC.
5209 EUCLID AVE. CLEVELAND, OHIO

A Complete Line

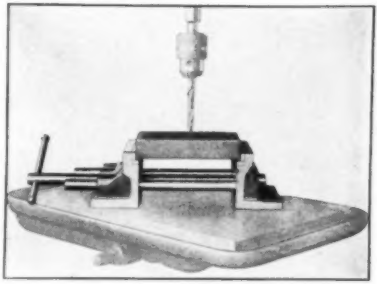
Counterbores and Countersinks, Counterbore Sets, Spotfacers, Coredrills, Reamers, Hollow Mills, Full Floating Holders, Facing Heads, Form Cutters, Boring Bars, Boring Heads, Adjustable Extension Holders, Multi Diameter Tools.



WRITE FOR CATALOG

THE GAIRING TOOL CO.
1635 West Lafayette Blvd., Detroit, Michigan

NATIONAL VISE FEATURES BUILT-IN PARALLELS



A vise with sturdily built-in parallel bars insuring the work always resting in perfect alignment, has been placed on the market by the National Machine Tool Company of Racine, Wisconsin. This feature allows holes to be accurately drilled clear through with a 2″ clearance, without any interference from chips or burrs.

Another advantage claimed by the makers of this Vise is that it can be used on all three sides, thereby saving time and reducing costs on all drilling operations. It can also be used as well for drilling round work, since V-grooves will hold stock securely at all times.

ROSS MFG. CO. BUILDS SMALL PUNCH PRESS

A complete Punch Press with an attached safety device for use in producing small parts, etc., has been designed by the David J. Ross Company of Benton Harbor, Michigan. The Press is claimed to be built to stand years of constant use. It is easy to operate and ideal for piece work and volume production. The floor space which it requires, 12 in. by 13 in., is in itself a money-saving feature.

The size of the bed is 10 in. by 7 in. and is ¾-in. thick with a 6-inch opening through the back of the throat. The distance from the bed to the gibs reclines from upright to 6 in., and the distance from the bed to the ram at the top of the stroke is 5½ in. The amount of die space available from the bed to the slide (stroke down, adjustment up) is 4 inches.

(*Continued on Page 52*)

Send for a new catalog showing other sizes and styles

PROGRESSIVE TOOL & CUTTER CO.
FERNDALE, MICHIGAN

Acme Standardized Drill Jig Bushings

Acme Drill Jig Bushings are a standardized product, carried in stock for prompt delivery in over 6,700 standard items. They are completely finished and ready for use. The Bushings are made by the most exacting scientific methods, which insures long wear, accurate fit and absolute satisfaction. Special sizes made to order.

Send for our Bulletin, which gives complete details, sizes available, and low prices.

ACME INDUSTRIAL CO.
419 N. Carpenter St., Chicago

A 2½-in. by 2½-in. faced ram has a down stroke pressure of 3¼ tons with a stroke of 1¼ in. Stroke adjustments can be made up to 1¼ in.

The Punch Press requires 1/3 h.p. to turn the 24-pound, 10-inch diameter fly-wheel at 175 r.p.m. The crank shaft main bearings have a diameter of 1-1/16 in. with a 2-inch diameter at crank bearings.

LYON 15 TON HYDRAULIC LIFT TRUCK

This fifteen ton Hydraulic Lift Truck, it is believed, is a lift truck of the greatest capacity of any hand lift truck heretofore built.

This Lift Truck was recently built by the Lyon Iron Works, Greene, New York, for a customer making automobile stampings and used by them in transfering dies to and from their large stamping presses.

A handle is provided for pulling by hand and a towing hitch is also provided so that it may be towed by a power truck. The elevating frame is raised by means of hydraulic rams operated by a hand hydraulic pump.

The carrying platform is 30″ wide by 84″ long and has a lowered height of 9¼″ and elevates 3¾″.

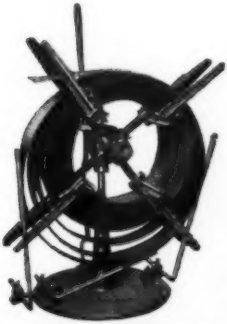
There are four rear wheels (not shown in photograph) of wide face, and two front wheels, all with extra large ball bearings. Easy turning is obtained by large thrust and radial bearings in the fifth wheel steer.

The main frame and elevating frame are made of heavy structural members electric arc welded.

BALLOON TIRED FLOOR TRUCK FOR METAL WORKING PLANTS

A new type floor truck equipped with easy rolling industrial balloon tires, has just been announced by the Lewis-Shepard Company, of Boston, Mass., for those metal-working plant owners who desire to eliminate un-

(Continued on Page 54)



Coiled Stock Can be Handled Most Efficiently with Littell Automatic Centering Reels

Littell Automatic Centering Reels enable one man to load and center heavy coils in less than two minutes regardless of the difference in inside diameters between one coil and the next. Centered coils turning on ball bearings revolve with the greatest of ease. This condition means greater production for both hand feeding and automatic feeding of coiled stock.

Write today for circular No. 5

F.J. LITTELL MACHINE CO., 4125 Ravenswood Av., CHICAGO
Mfr's of Punch Press Feeds and Reels

ANNOUNCING!—
RED HEAT STELLITE CENTERS

Manufactured by Scully-Jones

LONG LIFE, HEAT RESISTING, LOW COST

ORDER A SET FOR YOUR TOUGHEST JOBS

No. 1 MORSE TAPER STELLITE CENTER	$1.75
No. 2 " " " "	2.50
No. 3 " " " "	3.25
No. 4 " " " "	4.75
No. 5 " " " "	9.25

JARNO, BROWN & SHARPE AND SPECIALS. PRICES ON REQUEST.
STELLITE END SWAGED ALLOY BODY

Circular No. 70 Gives Complete Information

SCULLY-JONES & CO., 1909 So. Rockwell St., CHICAGO, ILLINOIS

necessary noises, save floors from wear, as well as insure their products from being damaged in moving. The new truck, "Q" type No. 1595, is constructed of a one-piece steel frame, arc-welded throughout, with smooth flush hardwood tops, steel bounded all around. It is equipped with roller bearings on all wheels and casters.

The Lewis-Shepard Company has also published a four-page illustrated bulletin offering the latest information on equipment for handling tin plate and sheets in warehouses, can factories, tin lithograph plants, tinware plants, and stamping plants. This bulletin No. 302, which illustrates special lift trucks, portable elevators, stackers and lifts, and lifting devices, may be had merely by writing the manufacturer.

BIGGEST PRESS BRAKE IS ARC WELDED

Completion of a steel press brake of 500 tons capacity and capable of bending materials 16 feet long is announced by the Boom Boiler and Welding Co., Cleveland, Ohio.

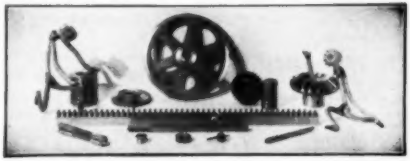
Construction is entirely of steel, arc welded. All welding was done by the shielded arc process with equipment supplied by the Lincoln Electric Co., Cleveland. No castings were used.

Revolutionary in design, the huge brake pulls together two leaves instead of pushing down one leaf. This eliminates approximately 30 percent in construction and permits easy adjustments of the bottom leaf, movement of which is controlled by a worm drive.

All driving mechanism and adjustment shafts are below the floor level, leaving the entire top clear and eliminates any danger from possible overhead breakage.

Overall, the brake is 24 ft. 2 in. long, 7 ft. 1 in. wide and 9 ft. 11 in. high. The two leaves are 17 ft. 7 in. long and weigh 8 tons. Total weight is 61 tons. Power is furnished by a 30 h.p. electric motor with a 2-ton flywheel and is transmitted by V belts to gears and shafting. The brake has two speeds—four strokes or twenty strokes a minute.

SMALL GEARS



ALSO
MEDIUM SIZES IN ALL TYPES
AND MATERIALS

Massachusetts Gear & Tool Co.
36 Nashua St. Woburn Mass.

"Gusher" Pump and Tank Unit

This is a complete pumping unit, easily moved about and always ready for use. Equipped with the well-known ***"Gusher" Pump,*** which is noted for its simplicity, with elimination of extra parts and valves. It needs no priming and delivers a steady high volume with low pressure. Many other exclusive features are of value to the user. Heavy duty casters are optional. There's a Ruthman Pump for every machine, priced within the reach of all.

Write for complete data

Let "GUSHERS" reduce your pumping costs.

THE RUTHMAN MACHINERY CO.
528 E. Front St., Cincinnati, Ohio

SOUTH BEND LATHE WORKS PUBLISHES INFORMATIVE BOOKLETS

Two new booklets, "How To Cut Screw Threads" and "How To Grind Lathe Tool Cutter Bits", have just been published by The South Bend Lathe Works, South Bend, Indiana, and are now available to readers of this magazine.

The material is presented in such a way that it is easily understood, and the booklets contain a number of illustrations to give the reader a clear-cut idea of each operation.

"How To Cut Screw Threads in the Lathe" contains a detailed step-by-step description of cutting threads in a lathe, sets of tables of standard screw thread pitches and recommended tap drill sizes, definitions of various terms relating to screw threads and several pages devoted to arrangements of gearing. Space is also given to metric screw threads, the use of taps and dies, formulas for standard screw thread forms and many interesting shop hints and kinks.

The second booklet, "How To Grind Lathe Tool Cutter Bits", gives the methods for grinding all the popular types of lathe tool cutter bits, and illustrates the particular angles to which each cutter bit should be ground. The applications for which each of these tools is used are also illustrated, with the manner of applying the tool to obtain maximum efficiency.

The booklets may be obtained from The South Bend Lathe Works, South Bend, Indiana, for a nominal charge of ten cents a copy.

PEERLESS SURFACERS

Give a high quality, straight line finish to metal, rubber, fibre composition, wood, etc.

QUICK HANDY LABOR SAVING

Vertical or horizontal 4' to 20'

PRODUCTION MACHINE CO.

GREENFIELD, MASS.

NORGREN

Regulating and Reducing Valves

For air, steam, oil, water and non-corrosive gases. Wide range of pressures up to 400 lbs. initial—5 to 200 lbs. secondary. Unrestricted flow, close regulation. ***Write for complete description and prices.***

C. A. NORGREN CO., (Inc.)

2012 Market Street, Denver, Colorado

WYCO HAS QUARTERS IN NEW YORK

Wyzenbeek & Staff, Inc., of Chicago, well-known manufacturers of The Wyco Line of tools and flexible shaft machinery, have opened a New York office and warehouse at 2659 Webster Ave., Bronx, New York.

The new office is organized for stock fill-in convenience of the mill supply, automotive and hardware jobbers serving Greater New York.

James A. White is the managing director, assisted by Mr. A. Turk. He is well-known to the trade, having served for a long time as eastern representative for several nationally-known manufacturers.

GEORGE H. FELTES DIES AT 56

George H. Feltes, international figure in the machinery and mill supply industry and President and Treasurer of the Standard Electrical Tool company, Cincinnati, Ohio, died suddenly May 6 at French Lick Springs, Indiana.

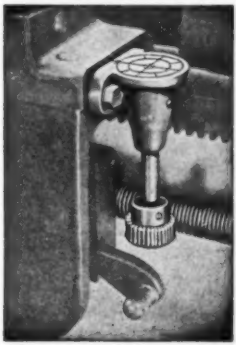
Apparently in good health, Mr. Feltes was seized with an attack of acute indigestion following a game of golf and died shortly afterward.

Mr. Feltes was a pioneer in the electrical tool industry. He entered the field in 1903 when he financed the organization of the United States Electrical Tool Co., of which he was Secretary, Treasurer and Sales Manager until 1925, when he retired.

Retiring, he often said, was harder work than he had ever done in business, and for this reason he reentered business in 1926 by acquiring control of the Standard Electrical Tool Co.

Surviving are his widow, three sisters and a brother, Richard C. Feltes, vice-president of Standard Electrical Tool Co.

THE E-Z THREAD DIAL



The E-Z Thread Dial is a device to facilitate thread cutting on engine lathes. It can be attached to any size and most makes of screw cutting lathes. The operator need not worry about "running by" or spoiling the work as he can stop the cut when and where he desires. It makes a hard job easy.

The lathe need not to be stopped nor reversed until the thread is finished. Also permits increased speed, due to certainty of stopping at the desired point.

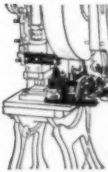
The many repeat orders have demonstrated its worth.

Made in four sizes, to attach to any make of screw cutting lathe.

Sent on 30 days' trial. Give number of threads on lead screw; state if square, V or Acme thread, right or left hand, and give distance from top of carriage to center of lead screw.

JAMES A. COLVEN

20 Wolffe Street, Yonkers, N. Y.



Speed up
punch press
production

Triple your Punch Press Production at low cost. Feed ***automatically*** any stock from coils in lengths from 0" to 24" per press stroke. Save time, operating costs and dies. ***Accurate***—reduce scrap to a minimum. Types for every requirement—Single Roll, Double Roll and Compound type with straightener

WITTEK
High-Speed
ROLL FEEDS

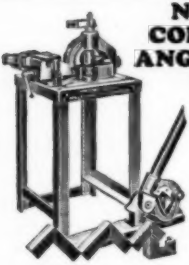
WITTEK
Universal
REEL STAND

WITTEK Reel Stands

Automatic Self-Centering, Ball-Bearing or plain. Adjustable to any height, balanced at any angle, 500 lb. capacity. Prompt deliveries from stock.

WITTEK MANUFACTURING COMPANY
4305-9 W. 24TH PLACE, • • • • • CHICAGO, ILL.

WHITNEY TOOLS



No. 455 COMPLETE ANGLE-IRON UNIT

Capacity 2"x2"x¼" angle iron Weight 225 pounds.

SPEED

Notches and Bends 2"x 2"x¼" Angle Iron in One Minute Flat.

BALL BEARING PUNCH No. 20

Capacity, ½" thru ½" iron. Weight, 20 lbs. Will Also Drive Rivets.

Write for Catalog and Price List on Entire Line

WHITNEY METAL TOOL COMPANY
95 FORBES ST., ROCKFORD, ILL.

BLOW or SUCTION CLEAN with CLEMENTS-CADILLAC

Portable Electric BLOWER

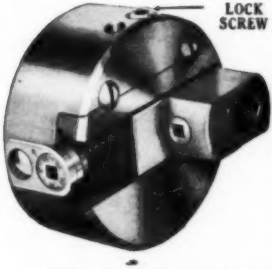
Drives DRY AIR, free from oil or moisture at great velocity but low pressure. Removes dust, lint, wood or metal particles — reducing risk of "shorts" and "burn-outs," cuts down fire hazard and excess wear. Convertible to sprayer or suction cleaner.

Most Useful Tool in Any Machine Shop, Factory or Power Plant. It KEEPS MACHINERY CLEAN.

TRY IT—FREE!

CLEMENTS MFG. CO.
6650 So. Narragansett, CHICAGO, ILL.

FLYNN MICROMETER OFFSET BORING HEADS



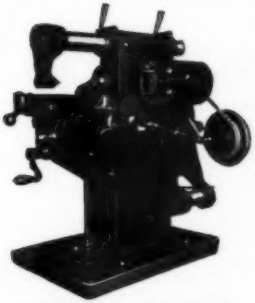
No. 30

This dovetail designed head is particularly useful where a large offset is required. Body is solid steel, dovetailed hardened tool holder has 2½" offset. Tension gib and locking device takes strain of micrometer screw. Dial graduated in thousandths, 50 thousandths to a turn, insuring accurate adjustment in boring. Bar capacity is ¼-¾.

Write for information on other styles and sizes

FLYNN MANUFACTURING CO.

435 Bates St., Detroit, Mich.



No. 4 Motor Driven Milling Machine

BURKE
Milling Machine

This motor drive is available on our Nos. 1, 2, 3 and 4 Milling Machines.

Reversing switch has been conveniently located for the rapid handling of small work

Either ball or plain bearing spindles

Write for Circulars

The Burke Machine Tool Co., 297 E. 16th St., Conneaut, Ohio

NEW! MODERN!

★ MODERN DESIGN ★
MODERN CONSTRUCTION

The new Atlas lathes were designed and built to give more value—accuracy—efficiency and satisfaction than ever before during the 25 years Atlas has been building precision shop equipment. The back-geared model shown has 36" bed, 10¼" swing, and takes 18" between centers. Accurate to .001" for those precision jobs in manufacturing, tool room, or laboratory. Can be fitted with attachments for all machine shop operations.

Other new Atlas metal lathes priced from $35.50 up. Sold on monthly payments if desired. 2 weeks trial. Money back guarantee. Send for latest catalog of metal and wood working lathes, drill presses, tools, and attachments — illustrating today's outstanding equipment values.

ATLAS PRESS CO., 650 N. Pitcher St. Kalamazoo, Mich.

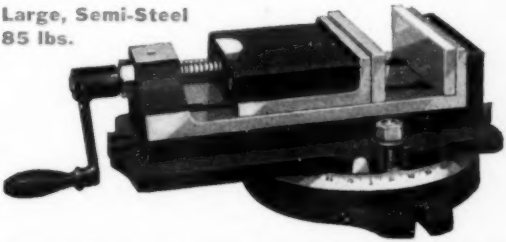
Complete Displays at:

CHICAGO 35 E. Wacker Dr. **NEW YORK** 130 W. 42nd St. **PHILADELPHIA** 113 N. 3rd St.

SUPER Values that are OUTSTANDING

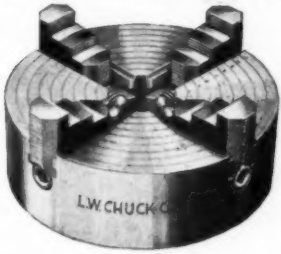
Swivel MILLING MACHINE VISE

Large, Semi-Steel
85 lbs.



This large semi-steel vise which can be used plain or swivel is suitable for milling machine, drill press or shaper. Has sturdy 6½" steel jaws, 2" deep. Jaws open 4½", or 5¼" without steel jaws. Four bolts and key slots provide for attaching to machine table holding surface and jaws at right angles or parallel to table. Shipping weight 90 lbs. **$29.50**

12" 4-JAW Independent



LATHE CHUCK

Semi-steel construction with heavily ribbed body to withstand unusual strains. Ground finish. Four independent jaws made of accurately ground and fitted hardened steel. Reversible. Has 1¼" tough nickel steel screws. Weight 75 lbs.

Every L-W Chuck made of the best material and workmanship, guaranteed to give satisfactory service. A real value at **$33.50**

Also MAGNETIC CHUCKS and DIVIDING HEADS

L-W CHUCK CO., TOLEDO, OHIO

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Price
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Ask Your Supply House for a Demonstration.

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Unmatched performance—a sensation wherever used, in experimental laboratory, model and tool room, on the production line in large and small plants—making, shaping, polishing all metal products, alloys, glass, composition materials, wood, stone, etc.

Use this amazing tool for difficult precision jobs—corners, ledges and other places hard to get at—on intricate machine parts without removing the parts or dismantling machine. 200 different accessories available, especially made to fit the quick-acting, wrenchless chuck.

Take right to job—plug in any electric socket—110 volt AC or DC.

CARVES · ENGRAVES

Fastest, most powerful tool for its weight and type ever developed. 25,000 r.p.m. Weighs 12 ounces. Almost human in its smooth, rapid response. Try a Handee! Test for yourself its marvelous efficiency.

Order Today On 10 Days' Trial or Send for Catalog

CHICAGO WHEEL & MFG. CO.

116 S. Aberdeen St., Chicago, Illinois

☐ **Send Catalog**

☐ **Send DeLuxe Handee on 10 Days' Trial**

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USE MALL MACHINES TO INCREASE PRODUCTION

in every industry . . . for polishing, buffing, and grinding.

There is a MALL machine with a specific working tool for every job.

Bulletins on request!

MALL TOOL COMPANY, 7742 South Chicago Ave., Chicago, Illinois

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Keep Stock Off the Floor— Save Time, Steps and Money!

HANDIEST RACKS

Bar stock. pipe, shafting and other supplies are instantly available to the machine operator when they are kept at his elbow on HANDIEST RACKS. No need for leisurely trips to the storeroom—no need for searching through heaps of supplies. In storeroom or shop, HANDIEST RACKS keep stock in plain sight—handy for use or for taking inventory.

Shipped on FREE TRIAL.

Write for all details today.

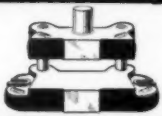
WM. S. YOHE SUPPLY CO.

503 Mahoning Road, N. E. CANTON, OHIO

BETTER-MADE DIE SETS

BAUMBACH

AT LOWER COST



24 DIFFERENT STYLES

OVER 95,000 SIZES

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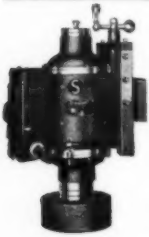

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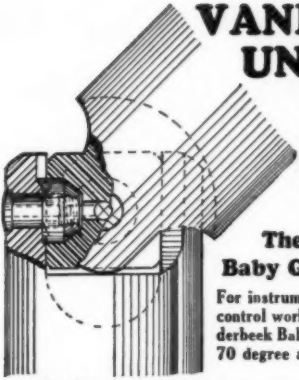

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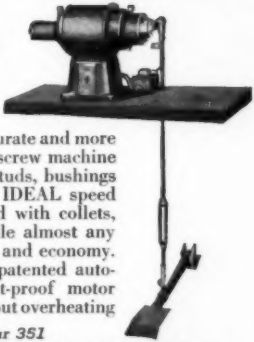

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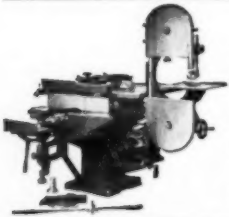

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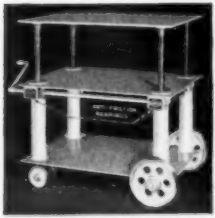

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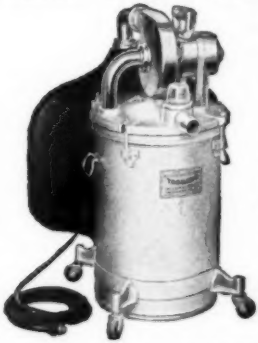

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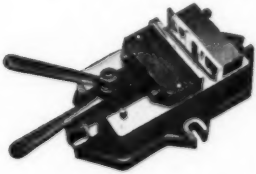

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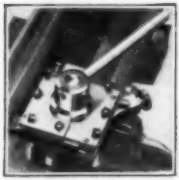

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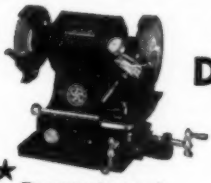

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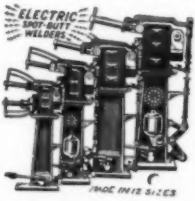

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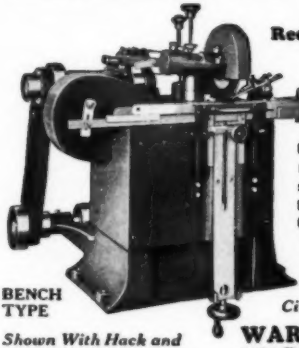

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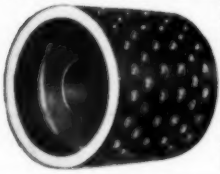

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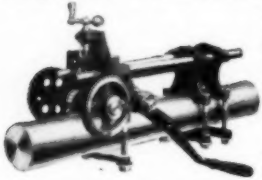

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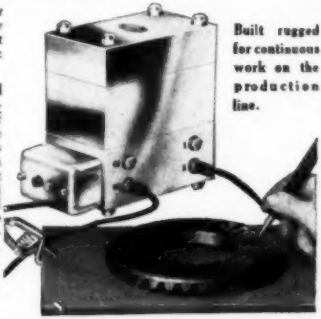

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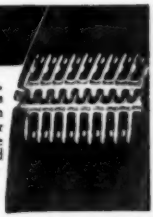

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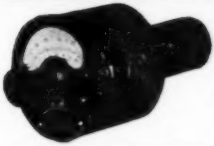

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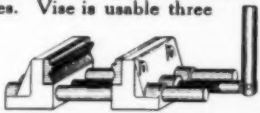

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Clements Mfg. Co., 6650 Narragansett, Chicago
Skilsaw, Inc., 3304 Elston Av., Chicago, Ill.
Standard Electrical Tool Co., Cincinnati, O.

Blue Print Machinery
Milligan & Wright Co., Cleveland, Ohio

Boring Bars
Chicago Tool & Engr. Co., 3380 So. Chicago Ave., Chicago, Ill.
Maxwell & Co., F. A., Bedford, Ohio
The Rigid Toolholder Co., Detroit, Mich.
Russell Boring Bar Co., Middletown, Ohio

Boring Heads
Flynn Manufacturing Co., Detroit Mich.

Boring Machines
Cleveman Mchs. Tool Co., Green Bay, Wis.
Hack Universal Die Making Machine Co., 440 N. Oakley Blvd., Chicago, Ill.

Broaches, Spline and Square
Taylor Machine Co., Cleveland, Ohio

Brakes, Hand and Power
Dreis & Krump Mfg. Co., 7440 So. Loomis Blvd., Chicago, Ill.

Briquetting Machines
Grob Bros., West Allis, Wis.

Broaching Machines
Hack Universal Die Making Machine Co., 440 N. Oakley Blvd., Chicago, Ill.

Brushes, Motor and Generator
Seager Carbon Co., 98 Park Place, New York City

Buffers, Bench
Standard Electrical Tool Co., Cincinnati, O.
Valley Electric Corp., St. Louis, Mo.
Vonnegut Moulder Corp., Indianapolis, Ind.

Buffers, Pedestal
Standard Electrical Tool Co., Cincinnati, O.
Valley Electric Corp., St. Louis, Mo.
Vonnegut Moulder Corp., Indianapolis, Ind.

Burs, Steel
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Bushings, Steel
Acme Industrial Co., 419 N. Carpenter St., Chicago, Ill.
Baumbach Mfg. Co., E. A., 1812 So. Kilbourne Ave., Chicago

Bushings, Jig
Acme Industrial Co., 419 N. Carpenter St., Chicago, Ill.

Call Systems
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Cams, Alloy Steel
Modern Collet & Mchs. Co., Ecorse, Mich.

Centering Machines
Sundstrand Machine Tool Co., Rockford, Ill.
Cullman Wheel Co., 1350 Altgeld St., Chgo.

Centers, Lathe
Rigid Tool Holder Co., Detroit, Mich.

Chains, Silent and Roller
Chicago Gear Works, 769 W. Jackson Blvd., Chicago
Cullman Wheel Co., 1350 Altgeld St., Chgo.

Chamfering Machines, Automatic
Grant Mfg. & Mchs. Co., Bridgeport, Conn.

Chucks
Ettco Tool Co., 594 Johnson Av., Brooklyn, N. Y.
Heuser Mfg. Co., 1638 No. Paulina St., Chicago, Ill.
Scully-Jones & Co., 1909 S. Rockwell St., Chicago, Ill.

Chucks, Automatic
Procunier Safety Chuck Co., 14 S. Clinton St., Chicago

Chucks, Collet
Procunier Safety Chuck Co., 14 S. Clinton St., Chicago

Chucks, Drill and Tap
Hartford Special Mchy. Co., Hartford, Conn.
Procunier Safety Chuck Co., 14 S. Clinton St., Chicago
Scully-Jones & Co., 1909 S. Rockwell St., Chicago, Ill.

Classified Finding Index

Chucking Fingers
Modern Collet & Mchc. Co., Ecorse, Mich.

Chucks, Quick Change
Procunier Safety Chuck Co., 14 So. Clinton St., Chicago

Chucks, Ring Wheel Grinder
Graham Manufacturing Co., Providence, R. I.

Chucks, Segment Wheel
Rogers & Co., Samuel C., Rochester, N. Y.

Cold Saws
Burke Machine Tool Co., Conneaut, Ohio

Collets for all Lathes and Millers
Hardinge Brothers, Inc., Elmira, N. Y.
Modern Collet & Mchc. Co., Ecorse, Mich.
Sutton Tool Co., Detroit, Mich.

Collets for Auto. and Hand Screw Machines
Sutton Tool Co., Detroit, Mich.

Collets, Spring
Modern Collet & Mchc. Co., Ecorse, Mich.

Collet Tubes
Modern Collet & Mchc. Co., Ecorse, Mich.
Sutton Tool Co., Detroit, Mich.

Contract Work Wanted
Burke Machine Tool Co., Conneaut, O.

Core Drills
Gairing Tool Co., Detroit, Mich.

Counterbores
Gairing Tool Co., Detroit, Mich.

Counterbores and Spot Facers
Scully-Jones & Co., 1909 S. Rockwell St., Chicago, Ill.

Couplings, Compression Shaft
W. H. Nicholson & Co., Wilkes Barre, Pa.

Couplings, Flexible
Lovejoy Tool Works, 5026 W. Lake St., Chgo.
W. H. Nicholson & Co., Wilkes-Barre, Pa.

Couplings, Shaft
W. H. Nicholson & Co., Wilkes-Barre, Pa.

Cut-off Saws
Tannewitz Works, Grand Rapids, Mich.

Cutters
Putnam Tool Co., Detroit, Mich.
Progressive Tool & Cutter Co., Ferndale, Mich.

Cutters, Keyseating
Scully-Jones & Co., 1909 S. Rockwell St., Chicago, Ill.

Cutters, Belt
Flexible Steel Lacing Co., 4670 Lexington St., Chicago, Ill.

Cutter Grinders, Universal
Geo. Gorton Machine Corp., Racine, Wis.

Cutters, Milling
Scully-Jones & Co., 1909 S. Rockwell St., Chicago, Ill.

Cutting, Service
Machinist's Tool Grinding Co., 3038 W. Van Buren St., Chicago

Demagnetizers
Lunn Electric Equipment Co., Toledo, Ohio

Desks
Angle Steel Stool Co., Plainwell, Mich.

Dies, Blank and Forming
American Tool Works, Inc., Hartford, Conn.
Hamilton Tool Company, Hamilton, Ohio

Die Making Machines
Hack Universal Die Making Machine Co., 440 N. Oakley Blvd., Chicago, Ill.
Oliver Instrument Co., Adrian, Mich.

Die Sets
Baumbach Mfg. Co., E. A., 1812 So. Kilbourne Ave., Chicago

Die Sinking and Engraving Machines
Pratt & Whitney Co., Hartford, Conn.

Dividing Heads
Wm. Carroll & Son, Norwood, Cincinnati, O.

Dowel Pins, Steel
Acme Industrial Co., 419 N. Carpenter St., Chicago, Ill.
Baumbach Mfg. Co., E. A., 1812 So. Kilbourne Ave., Chicago

Dressers, Radius
Vinco Tool Co., Detroit Mich.

Drill and Tap
Etco Tool Co., 594 Johnson Av., Brooklyn, N. Y.

Drill Holders
Chicago Tool & Engr. Co., 8380 So. Chicago Ave., Chicago, Ill.

Drills, Electric
SpeedWay Mfg. Co., 1822 So. 52nd Ave., Cicero, Ill.
Skilsaw, Inc., 3304 Elston Av., Chicago, Ill.
Standard Electrical Tool Co., Cincinnati, O.

Drill Grinders
Star Mchc. & Eng. Co., Bloomfield, N. J.

Drill Jigs, Special
Heuser Mfg., Co., 1638 No. Paulina St., Chicago, Ill.

Drill Jigs, Universal
Heuser Mfg. Co., 1638 No. Paulina St., Chicago, Ill.

Drilling Attachments, High Speed
Graham Manufacturing Co., Providence, R. I.

Drilling Machines, Bench
Atlas Press Co., Kalamazoo, Mich.
Buffalo Forge Company, Buffalo, N. Y.
Cleereman Mchc. Tool Co., Green Bay, Wis.

Drilling Machines, Gang
Standard Electrical Tool Co., Cincinnati, O.

Classified Finding Index

Drilling Machines, Portable Electric
Skilsaw, Inc., 5304 Elston Av., Chicago, Ill.
SpeedWay Mfg. Co., 1822 So. 52nd Ave., Cicero, Ill.
Standard Electrical Tool Co., Cincinnati, O.
Strand Co., N. A., 5001 N. Lincoln St., Chgo
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Drilling Machines, Sensitive
Atlas Press Co., Kalamazoo, Mich.
Buffalo Forge Company, Buffalo, N. Y.
Burke Machine Tool Co., Conneaut, Oh

Drilling Machines, Vertical
Atlas Press Co., Kalamazoo, Mich.
Buffalo Forge Company, Buffalo, N. Y.

Drives, Lathe
Cullman Wheel Co., 1359 Altgeld St., Chgo.
Hardings Brothers, Inc., Elmira, N. Y.

Electric Blowers
Breuer Elect. Co., 846 Blackhawk St., Chgo.
Clements Mfg. Co., 6650 Narragansett Chicago
Standard Electrical Tool Co., Cincinnati, O.

Electric Motors with Integral Brakes
Star Mchs. & Eng. Co., Bloomfield, N. J.

Electrical Instruments
Illinois Testing Laboratories, Inc., 150 W. Austin Ave., Chicago

Elevating Tables
Hamilton Tool Company, Hamilton, Ohio

Emery Wheel Dressers and Cutters
Western Tool & Mfg. Co., Springfield, O.

Emery Wheel Dressers, Diamond
Mendes Cutting Factories, Inc., 505 Fifth Ave., New York City

End Mills
Progressive Tool & Cutter Co., Ferndale, Mich.
Putnam Tool Co., Detroit, Mich.

Engraving Machines
Geo. Gerton Machine Co., Racine, Wis.

Etching Machines, Electric
Luma Electric Equipment Co., Toledo, Ohi.

Exhaust Blowers
Standard Electrical Tool Co., Cincinnati, O.

Experimental Work
American Tool Works, Inc., Hartford, Conn.

Fasteners, Belt
Flexible Steel Lacing Co., 4670 Lexington St., Chicago, Ill.

Feeder Tubes
Sutton Tool Co., Detroit, Mich.

Feed Fingers for Auto. Screw Mchs.
Modern Collet & Machine Co., Ecorse, Mich.
Sutton Tool Co., Detroit, Mich.

Files
Grobet File Co., 3 Park Place, New York City
Saw & Knife Specialty Co., Cleveland, Ohio

Files, Rotary
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Filing Machines
Grob Bros., West Allis, Wis.
Oliver Instrument Co., Adrian, Mich.

Filing Room Equipment
Wardwell Manufacturing Co., Cleveland, O.

Flexible Shaft Accessories
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Flexible Shaft Machinery
Haskins Co., N. G., 4654 W. Fulton, Chgo.
Pratt & Whitney Co., Hartford, Conn
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Floating Holders
Gairing Tool Co., Detroit, Mich.

Furniture, Machine Shop
Western Tool & Mfg. Co., Springfield, O.

Gages
Vinco Tool Co., Detroit, Mich.

Gages, Pin, Plug, Ring and Snap
American Tool Works, Inc., Hartford, Conn.

Gages, Taper
Hartford Special Mchy. Co., Hartford, Conn.

Gears
Chicago Gear Works, 769 W. Jackson Blvd., Chicago
Massachusetts Gear & Tool Co., Woburn, Mass.
Taylor Machine Co., Cleveland, Ohio

Gears, Master
Vinco Tool Co., Detroit, Mich.

Gear Motors
Star Mchs. & Eng. Co., Bloomfield, N. J.

Generators
Chicago Electric Co., 1888 W. 22nd St., Chicago, Ill.
Star Mchs. & Eng. Co., Bloomfield, N. J.

Grinders, Bench
Baldor Electric Co., St. Louis, Mo.
Standard Electrical Tool Co., Cincinnati, O.
Vonnegut Moulder Corp., Indianapolis, Ind.

Grinders, Disc
Standard Electrical Tool Co., Cincinnati, O.
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Grinder, Electric
Chicago Wheel & Mfg. Co., M. C. Tool Div., 116 So. Aberdeen St., Chicago, Ill.
Skilsaw, Inc., 5304 Elston Av., Chicago, Ill.
Standard Electrical Tool Co., Cincinnati, O.

Grinders, Electric Bench
Baldor Electric Co., St. Louis, Mo.
Standard Electrical Tool Co., Cincinnati, O.
Valley Electric Corp., St. Louis, Mo.

Grinder, Flexible Shaft
Haskins Co., N. G., 4654 W. Fulton, Chgo.
Mall Tool Co., 7743 S. Chicago Ave., Chicago
N. A. Strand & Co., 5001 N. Lincoln, Chgo.

Classified Finding Index

Grinder, Hand
Chicago Wheel & Mfg. Co., M.C. Tool Div., 116 S. Aberdeen St., Chicago, Ill.
Skilsaw, Inc., 3304 Elston Av., Chicago, Ill.
Standard Electrical Tool Co., Cincinnati, O.

Grinders, Heavy Duty
Vonnegut Moulder Corp., Indianapolis, Ind.

Grinder, High Speed
Chicago Wheel & Mfg. Co., M.C. Tool Div., 116 S. Aberdeen St., Chicago, Ill.
Mall Tool Co., 7742 S. Chicago Ave., Chicago

Grinders, Pedestal Electric
Baldor Electric Co., St. Louis, Mo.
Standard Electrical Tool Co., Cincinnati, O.
Valley Electric Corp., St. Louis, Mo.

Grinders, Swing Frame
Vonnegut Moulder Corp., Indianapolis, Ind.

Grinders, Vertical, Angle Plate
Standard Electrical Tool Co., Cincinnati, O.

Grinding Attachments, Drill
Carlson Mfg. Co., C. H., Minneapolis, Minn.
Oliver Instrument Co., Adrian, Mich.

Grinding Machines, Belt
Production Machine Co., Greenfield, Mass.
Standard Electrical Tool Co., Cincinnati, O.
Walls Sales Corp., 26 Warren St., New York

Grinding Machines, Cutter, Reamer and Tool
Gallmeyer & Livingston Co., Grand Rapids, Mich.
National Machine Tool Co., Racine, Wis.
Oliver Instrument Co., Adrian, Mich.

Grinding Machines, Drill
Gallmeyer & Livingston Co., Grand Rapids, Mich.

Grinding Machines, External
Chicago Tool & Engr. Co., 8380 So. Chicago Ave., Chicago, Ill.
Standard Electrical Tool Co., Cincinnati, O.
Maxwell & Co., F. A., Bedford, Ohio

Grinding Machines, Face
Rogers & Co., Samuel C., Rochester, N. Y.

Grinding Machines, Floor
Standard Electrical Tool Co., Cincinnati, O.

Grinding Machines, Internal
Maxwell & Co., F. A., Bedford, Ohio
National Machine Tool Co., Racine, Wis.
Standard Electrical Tool Co., Cincinnati, O.

Grinding Machines, Knife
Rogers & Co., Samuel C., Rochester, N. Y.

Grinding Machines, Portable Electric
Chicago Tool & Engr. Co., 8380 So. Chicago Ave., Chicago, Ill.
Chicago Wheel & Mfg. Co., M.C. Tool Div., 116 S. Aberdeen St., Chicago, Ill.
R. G. Haskins Co., 4654 W. Fulton, Chicago
Mall Tool Co., 7742 S. Chicago Ave., Chicago
National Machine Tool Co., Racine, Wis.
Pratt & Whitney Co., Hartford, Conn.
Standard Electrical Tool Co., Cincinnati, O.
Strand Co., N. A., 5001 N. Lincoln St., Chicago
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Grinding Machines Pulley Finishing
Graham Manufacturing Co., Providence, R. I.

Grinding Machines, Ring Wheel
Graham Manufacturing Co., Providence, R. I.
Standard Elect. Tool Co., Cincinnati, Ohio

Grinding Machines, Shear Blade
Rogers & Co., Samuel C., Rochester, N. Y.

Grinding Machines, Surface
Gallmeyer & Livingston Co., Grand Rapids, Mich.
Standard Electrical Tool Co., Cincinnati, O.
Rogers & Co., Samuel C., Rochester, N. Y.

Grinding Machines, Tap
Gallmeyer & Livingston Co., Grand Rapids, Mich.

Grinding Machines, Universal
Gallmeyer & Livingston Co., Grand Rapids, Mich.

Grinding Wheels
Chicago Wheel & Mfg. Co., M.C. Tool Div., 116 S. Aberdeen St., Chicago, Ill.

Grinding Wheels, Mounted
Chicago Wheel & Mfg. Co., M.C. Tool Div., 116 S. Aberdeen St., Chicago, Ill.

Grinding Wheels On Shanks
Chicago Wheel & Mfg. Co., M.C. Tool Div., 116 S. Aberdeen St., Chicago, Ill.

Hack Saw Blades
Armstrong-Blum Mfg. Co., 841 N. Francisco Ave., Chicago

Hack Saw Machines
Armstrong Blum Mfg. Co., 841 N. Francisco Av., Chicago

Hammers, Mallets and Malls
Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Hammer Mo'ds
J. Horat Mfg. Co., Lafayette, Ind.

Hammers, Soft Metal
J. Horat Mfg. Co., Lafayette, Ind.

Hand Saws, Portable Electric
Skilsaw, Inc., 3304 Elston Av., Chicago, Ill.

Hand Screw Machines, Precision Bench Type
Hardinge Brothers, Inc., Elmira, N. Y.

Hangers, Ball, Roller and Babbitt
Pasman Bros., 705 W. Washington Blvd., Chicago, Ill.

Heads, Boring
Flynn Manufacturing Co., Detroit, Mich.

Hole Cutters
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Hollow Adjustable Mills
Gairing Tool Co., Detroit, Mich.
Genesee Mfg. Co., Rochester, N. Y.

Index Centers
Wm. Carroll & Son, Norwood, Cincinnati, O.

Jigs and Fixtures
American Tool Works, Inc., Hartford, Conn.
Hamilton Tool Company, Hamilton, Ohio
Hartford Special Mchy Co., Hartford, Conn

Keyseating Machines
Burr & Son, John T., Brooklyn, N. Y.

Knurls and Holders, for Turrets
Graham Manufacturing Co., Providence, R. I.

Lacing, Belt
Flexible Steel Lacing Co., 4670 Lexington St., Chicago, Ill.

Lamp Guards
Flexible Steel Lacing Co., 4670 Lexington St., Chicago, Ill.

Lapping Machines
Hack Universal Die Making Machine Co., 440 N. Oakley Blvd., Chicago, Ill.

Lathe Centers
Rigid Tool Holder Co., Detroit, Mich.

Classified Finding Index

Lathe Drives
Cullman Wheel Co., 1359 Altgeld St., Chgo.
Hardinge Brothers, Inc., Elmira, N. Y.

Lathes, Bench
Atlas Press Co., Kalamazoo, Mich.
Rivett Lathe & Grinder Inc., Brighton, Boston
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.
South Bend Lathe Works, South Bend, Ind.

Lathes, Back Geared
Rivett Lathe & Grinder, Inc., Brighton, Boston
South Bend Lathe Works, South Bend, Ind.

Lathes, Brake Drum
South Bend Lathe Works, South Bend, Ind.

Lathes, Engine
South Bend Lathe Works, South Bend, Ind.

Lathes, Gap Head
South Bend Lathe Works, South Bend, Ind.

Lathes, Manufacturing
Sundstrand Machine Tool Co., Rockford, Ill.

Lathes, Precision Bench
Hardinge Brothers, Inc., Elmira, N. Y.

Lathes, Precision Bench Screw Cutting
Hardinge Brothers, Inc., Elmira, N. Y.

Lathe Service Parts
Millholland Sales Co., Indianapolis, Ind.

Lathes, Screw Cutting
South Bend Lathe Works, South Bend, Ind.

Lathes, Speed
Schauer Machine Co., Cincinnati, Ohio

Leader Pins, Steel
Acme Industrial Co., 419 N. Carpenter St., Chicago, Ill.

Leather Belting, All Types
Chicago Rawhide Mfg Co., 1200 Elston Av., Chicago, Ill.

Leather Oil Retainers
Chicago Rawhide Mfg. Co., 1200 Elston Av. Chicago, Ill.

Leather Pkg., Hydraulic & Pneumatic
Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Lubricator, Automatic
Norgren Co., C. A., Denver, Colo.

Machine Knives
Saw & Knife Specialty Co., Cleveland, Ohio

Mandrels, Expanding
W. H. Nicholson & Co., Wilkes-Barre, Pa.
Western Tool & Mfg. Co., Springfield, O.

Micrometers
Bradley Machinery Co., Detroit, Mich.

Milling Attachments
Able Products Machine & Tool Works, Inc., 20 W. 22nd St., N. Y.
Burke Machine Tool Co., Conneaut, Ohio
Wm. Carroll & Son, Norwood, Cincinnati, O.

Milling Machines, Bench
Burke Machine Tool Co., Conneaut, Ohio
Sundstrand Machine Tool Co., Rockford, Ill.

Milling Machines, Precision Bench
Hardinge Brothers, Inc., Elmira, N. Y.

Milling Machines, Hand
Burke Machine Tool Co., Conneaut, Ohio
Sundstrand Machine Tool Co., Rockford, Ill.

Milling Machines, Plain
Burke Machine Tool Co., Conneaut, Ohio
Sundstrand Machine Tool Co., Rockford, Ill.

Milling Machines, Universal
Hack Universal Die Making Machine Co., 440 N. Ousley Blvd., Chicago, Ill.

Mills, Adjustable Hollow
Genesee Mfg. Co., Rochester, N. Y.

Molds, Hammer
J. Horst Mfg. Co., Lafayette, Ind.

Motors
Chicago Electric Co., 1338 W. 22nd St., Chicago, Ill.

Motor-Generator Sets
Chicago Electric Co., 1338 W. 22nd St., Chicago, Ill.

Motor Drives, Universal
Cullman Wheel Co., 1359 Altgeld St., Chgo.

Motors, Electric Ball Bearing
Valley Electric Corp., St. Louis, Mo.

Moulds & Ladles, Hammer and Vise.
Johnston Tool Co., East Providence, R. I.

Nibbling Machines
National Machine Tool Co., Racine, Wis.

Packing, Hydraulic
Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Pins and Lacing for Belting
Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Pins, Leader And Dowel
Acme Industrial Co., 419 N. Carpenter St., Chicago, Ill.
Baumbach Mfg. Co., E. A., 1812 So. Kilbourne Ave., Chicago

Pipe Cutters
Ridge Tool Co., Elyria, Ohio

Pipe Vises
Ridge Tool Co., Elyria, Ohio

Pipe Wrenches
Ridge Tool Co., Elyria, Ohio

Point Thinning Machines
Oliver Instrument Co., Adrian, Mich.

Press Brakes
Dreis & Krump Mfg. Co., 7461 Lesmis Blvd., Chicago, Ill.

Classified Finding Index

Presses, Arbor
Atlas Press Co., Kalamazoo, Mich.
W. H. Nicholson & Co., Wilkes-Barre, Pa.
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.
Wilson, R. K., Buffalo, N. Y.

Presses, Power
Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.

Presses, Punch
Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.
Lewthwaite Mchs.Co.,T.H.,311E.47th.,N.Y.

Production Tools
Genesee Mfg. Co., Rochester, N. Y.

Pullers, Gear and Wheel
Armstrong-Bray & Co., 315 N. Sheldon St., Chicago, Ill.

Pulleys, Steel and Wood
Pageman Bros., 705 W. Washington Blvd., Chicago, Ill.

Pulleys, Vacuum Cup
Vacuum Cup Metal Pulley Co., Detroit

Pumps, Coolant
Fulflo Specialties Co., Blanchester, Ohio

Pumps, Lubricant
Ruthman Machinery Co., Cincinnati, Ohio

Punch Press Feeds
Littell Machine Co., F. J., 4125 Ravenswood Ave., Chicago, Ill.
Wittek Mfg. Co., 4309 W. 24th Place, Chgo.

Punch, Shear and Bender, Hand
Armstrong-Blum Mfg. Co., 841 N. Francisco Ave., Chicago

Punches, Hand
Armstrong-Blum Mfg. Co., 841 N. Francisco Av., Chicago
Buffalo Forge Company, Buffalo, N. Y.
Lewthwaite Mchs. Co., T. H., 311 E. 47th. New York
Whitney Metal Tool Co., Rockford, Ill.

Punches and Dies
Lewthwaite Mchs.Co.,T.H.,311E.47th.,N.Y.

Pusher Tubes
Modern Collet & Machine Co., Ecorse, Mich.

Pyrometers
Illinois Testing Laboratories, Inc., 150 W. Austin Ave., Chicago
Pyrometer InstrumentCo.,102-105 Lafayette St., New York City

Pyrometers, Optical
Pyrometer InstrumentCo.,102-105 Lafayette St., New York City

Pyrometers, Portable & Stationary
Illinois Testing Laboratories, Inc., 150 W. Austin Ave., Chicago, Ill.

Pyrometers, Surface
Pyrometer InstrumentCo.,102-105 Lafayette St., New York City

Racks
Yoke Supply Co., Canton, Ohio

Racks, Cut
Massachusetts Gear & Tool Co., Woburn, Mass.

Reamer Holders
W. H. Nicholson & Co., Wilkes-Barre, Pa.

Riveters, Multiple Spindle
Grant Mfg. & Mchs. Co., Bridgeport, Conn.

Riveters, Pneumatic
Grant Mfg. & Mchs. Co., Bridgeport, Conn.

Riveting Machines
Grant Mfg. & Mchs. Co., Bridgeport, Conn.

Rod Cutters
Armstrong-Blum Mfg. Co., 841 N. Francisco Av., Chicago
Lewthwaite Mchs.Co.,T.H.,311 E.47th.N.Y.

Router Bits
Putnam Tool Co., Detroit, Mich.

Salvage
Vinco Tool Co., Detroit, Mich.

Saws, Band and Circular for Metal
Saw & Knife Specialty Co., Cleveland, Ohio

Saw Sharpening Machines
Rogers & Co., Samuel C., Rochester, N. Y.
Wardwell Manufacturing Co., Cleveland, O.

Screw Drivers, Electric
Haskins Co., R. G., 4654 W. Fulton, Chgo.

Screw Machine Parts
Modern Collet & Machine Co., Ecorse, Mich.

Shafts, Flexible
R. G. Haskins Co., 4654 W. Fulton, Chicago
Pratt & Whitney Co., Hartford, Conn.
Strand Co., N. A., 5001 N. Lincoln St., Chgo.
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Shaping Machines
Osborne & Sexton Machy. Co., Colum

Shear Blades
Saw & Knife Specialty Co., Cleveland, Ohio

Shears, Hand
Armstrong-Blum Mfg. Co. 841 N. Francisco Av., Chicago
Beverly Throatless Shear Co., 3007 W. 110th Place, Chicago, Ill.
Lewthwaite Machine Co., T. H., 311 E. 47th St., New York
Whitney Metal Tool Co., Rockford, Ill.

Shear, Power
Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.

Shears, Slitting
Beverly Throatless Shear Co., 3007 W. 110th Place, Chicago, Ill.
Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.
National Machine Tool Co., Racine, Wis.

Shears, Throatless
Beverly Throatless Shear Co., 3007 W. 110th Place, Chicago, Ill.

Speed Saws, Universal
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Classified Finding Index

Special Tools and Machinery
American Tool Works, Inc., Hartford, Conn.

Speed Reducers
Chicago Gear Works, 769 W. Jackson Blvd., Chicago
Cullman Wheel Co., 1359 Altgeld St., Chgo.

Spools & Nuts for Auto. Screw Mchs.
Sutton Tool Co., Detroit, Mich.

Spot Welding Machines, Speed.
Elster Engineering Co., Inc., Newark, N. J.
Pier Equipt. Mfg. Co., Benton Harbor, Mich.

Sprockets
Chicago Gear Works, 769 W. Jackson Blvd., Chicago
Cullman Wheel Co., 1359 Altgeld St., Chgo.
Massachusetts Gear & Tool Co., Woburn, Mass.

Stampings
Gerding Brothers, Cincinnati, Ohio

Steel Lockers and Shelving
Passman Bros., 705 W. Washington Blvd., Chicago, Ill.

Straightening Machines
Whitney Metal Tool Co., Rockford, Ill.

Tap Extractors
Walton Co., Hartford, Conn.

Tap Holders
Procunier Safety Chuck Co., 14 S. Clinton St., Chicago
Scully-Jones & Co., 1909 S. Rockwell St., Chicago, Ill.

Tapping Attachments
Procunier Safety Chuck Co., 14 S. Clinton St., Chicago, Ill.

Tapping Jigs, Universal
Houser Mfg. Co., 1639 No. Paulina St., Chicago, Ill.

Tapping Machines and Attachments
Burke Machine Tool Co., Conneaut, Ohio
Cleereman Mchs. Tool Co., Green Bay, Wis.
Etco Tool Co., 594 Johnson Av., Brooklyn, N. Y.
Haskins Mchy. Co., R. G., 4554 W. Fulton St., Chicago, Ill.
Procunier Safety Chuck Co., 14 So. Clinton St., Chicago, Ill.
Whitney Metal Tool Co., Rockford, Ill.

Thermometers, Resistance Type
Illinois Testing Laboratories, Inc., 150 West Austin Ave., Chicago, Ill.

Thread Dials
J. M. Colven, Yonkers, N. Y.

Threading Machines, Automatic, Stud
Grant Mfg. & Mchs. Co Bridgeport, Conn.

Threading Tools
Armstrong Bros. Tool Co., 908 N. Francisco Av., Chicago
Ridge Tool Co., Elyria, Ohio.
Rivett Lathe & Grinder Inc., Brighton, Boston

Tool Holders
Armstrong Bros. Tool Co., 908 N. Francisco Av., Chicago
Rigid Toolholder Co., Detroit, Mich.
Western Tool & Mfg. Co., Springfield, O.

Tool Post Turret
S. G. Colwell, Providence, R. I.

Tool Salvage
Renn Tool Co., Detroit, Mich.

Tools
Vinco Tool Co., Detroit, Mich.

Tools, Abrasive
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Tools, Boring
Armstrong Bros. Tool Co., 908 N. Francisco Av., Chicago
Gairing Tool Co., Detroit, Mich.

Tool Grinding
Machinist's Tool Grinding Co., 3038 W. Van Buren St. .Chicago

Tools, Lathe and Planer
Armstrong Bros. Tool Co., 908 N. Francisco Av., Chicago

Tools, Machinists'
Armstrong Bros. Tool Co., 908 N. Francisco Av., Chicago

Tools, Multi-Diameter
Gairing Tool Co., Detroit, Mich.

Tube Flanging Machines
Grant Mfg. & Mchs. Co., Bridgeport, Conn.

Turret Lathes
Millholland Sales Co., Indianapolis, Ind.

Turret Lathes Tools
Millholland Sales Co., Indianapolis, Ind.

Universal Drill Jigs
Houser Mfg. Co., 1639 No. Paulina St., Chicago, Ill.

Universal Joints
American Tool Works, Inc., Hartford, Conn.
Chicago Gear Works, 769 W. Jackson Blvd., Chicago

Used and Rebuilt Machinery
Alamo Engine Co., Hillsdale, Mich.
American Machinery Co., Cleveland, Ohio
Atlas Equipt. Co., 116 S. Clinton St., Chgo.
Barad tool & Sup. Co., 174 Lafayette, N. Y. C.
Beal & Co., Jos., Boston, Mass.
Beatty Machine Mfg. Co., Hammond, Ind.
Belyea Co., Inc., 150 W. 18th St., New York, N. Y.
Bernstein & Co., Geo. M., 128. Clinton, Chgo.
Bisser Mfg. & Mchy. Co., Springfield, Ill.
Bradley Machinery Co., Detroit, Mich.
Brown Machinery Co., St. Louis, Mo.
Brownell Machinery Co., Providence, R. I.
Clinton Mchy. Co., 33 S. Clinton St., Chgo
Columbia Machinery Co., Fort Wayne, Ind.
Craig, Thos. H., Bridgeport, Conn.
Davis Machinery Co., Toledo, Ohio.
Denny, W. I., 618 W. Lake St., Chicago
Centre Machinery Co., 249 Centre St., New York, N. Y.
Eastern Machinery Co., Cincinnati, O.
Emerman, Louis E. & Co., 1761 Elston Ave., Chicago, Ill.
Essley Machinery Co., E. I., 825 Reen St., Chicago, Ill.
Ford Machinery Sales Co., Ford City, Pa.

Classified Finding Index

Used and Rebuilt Machinery—Cont.

George, James W., Detroit, Mich.
Goldman, Harvey H., Detroit, Mich.
Harris Auction & Sales Co., Cincinnati, O.
Hill, Clarke & Co., 645 W. Washington Blvd., Chicago, Ill.
Howarth Mchy. Co., Inc., C. C., Detroit, Mich.
Hyman & Sons, Joseph, Philadelphia, Pa.
Indianapolis Machinery & Supply Company, Indianapolis, Ind.
International Machinery Co., Detroit, Mich.
Interstate Mchy. Co., 130 S. Clinton, Chgo.
Iroquois Machinery Co., Buffalo, N. Y.
Johnson & Sons Machinery Co., Wm. C., St. Louis, Mo.
Johnstone Mchy. Ex., Toledo, Ohio
Jones Machine Tool Co., Cincinnati, Ohio
Kennard-Rafkin Mchy. Corp., 160 Liberty St., New York, N. Y.
Kennard-Williams, 114 Liberty St., New York, N. Y.
Lucas, J. L., Bridgeport, Conn.
McDonald Machinery Co., St. Louis
Marr-Galbreath Mchy. Co., Pittsburgh, Pa.
Midwest Equipment Co., 632 W. Lake St., Chicago, Ill.
Mikes Machinery Co., Saginaw, W. S., Mich.
Molitor Machinery Co., Charles L., 120 S. Clinton St., Chicago, Ill.
Morey & Co., 45 Mill St., Astoria, Long Island, N. Y.
Morris Machinery Co., Newark, N. J.
Noble Mchs. Co., Fort Wayne, Ind.
Norton-Broadway Machinery Co., Cincinnati, Ohio
O'Brien Machinery Co., Philadelphia
Ohio Mchy. & Supply Co., Cincinnati, Ohio
Ott Machinery Sales Co., Detroit, Mich.
Osborne & Sexton Machy. Co., Columbus, O.
Reliance Machinery Sales Co., Pittsburgh, Pa.
Riverside Machinery Depot, Detroit, Mich.
Rosenkrans & Weisbecker, 2209 A Singer Bldg., New York City
Russell Machine Co., Pittsburgh, Pa.
Sampson Tool Co., 101 Walker St., New York, N. Y.
Scott-Bensbach Mchy. Co., 4607 W. 30th St., Chicago
Scully Jones & Co., 1901 S. Rockwell St., Chicago, Ill.
Segal Machinery Co., 117 S. Clinton St., Chicago, Ill.
Saxauer & Lemke, Inc., Long Isl. City, N. Y.
Simmons Machine Tool Corp., Albany, N. Y.
Standard Mchy. Co., Grand Rapids, Mich.
Ste n Mfg. Co., F., Springfield, Ill.
Stockman, John, A., Honesdale, Penna.
Strong, Carlisle & Hammond Co., Cleveland, O.
Sun Machinery Co., 22 Van Buren Street, Newark, N. J.
United Mchy. & Supply Co., St. Louis, Mo.
Victor Machinery Co., 129 S. Clinton Street, Chicago, Ill.
Vine, R. A., Detroit, Mich.
Wain Mchy. Sales, Chas. E., Detroit, Mich.
Weber, H. J., Riverside, Ill.
Wertman Machinery Co., Cleveland, Ohio
West Penn Machinery Co., Pittsburgh, Pa.
White Machy. Co., A. D., 108 N. Jefferson St., Chicago
Winterhoff Tool & Mchs. Co., Elkhart, Ind.
Wiener Mchy. Co., Inc., 237 Centre St., New York City
Wigglesworth Mchy. Co., Cambridge, Mass.
Wolnick Machinery Sales, 9 S. Clinton St., Chicago, Ill.

Vacuum Cleaners, Portable

Breuer Elec. Co., 846 Blackhawk St., Chgo.

Vacuum Cleaners, Industrial

Breuer Elect. Co., 846 Blackhawk St., Chgo.

Valves, Foot, Lever & Solenoid

Nicholson & Co., W. H., Wilkes-Barre, Pa.

Vises, Drilling Machine

Armstrong-Blum Mfg. Co., 841 N. Francisco Av., Chicago
Armstrong Bros. Tool Co., 308 N. Francisco Av., Chicago
Graham Manufacturing Co., Providence, R. I.
Heuser Mfg. Co., 1639 So. Paulina St., Chicago, Ill.
L. W. Chuck Co., Toledo, Ohio
Martin Tool & Die Works, J. E., Springfield, O.
National Machine Tool Co., Racine, Wis.
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.

Vises, Drill

Johnson Tool Co., East Providence, R. I.

Vises, Machinists'

Chicago Tool & Engr. Co., 3380 So. Chicago Ave., Chicago, Ill.
L. W. Chuck Co., Toledo, Ohio
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.
Western Tool & Mfg. Co., Springfield, O.

Vises, Milling Machine

Graham Manufacturing Co., Providence, R. I.
Hartford Special Mchy. Co., Hartford, Conn.
L. W. Chuck Co., Toledo, Ohio
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.

Vises, Shaper

Graham Manufacturing Co., Providence, R. I.
L. W. Chuck Co., Toledo, Ohio

Vises, Universal Swivel

Able Products Machine & Tool Works, Inc., 20 W. 22nd St., N. Y.

Waste Cans

Angle Steel Stool Co., Plainwell, Mich.

Welding Machines, Electric Spot

Eisler Engineering Co., Inc., Newark, N. J.
Fier Equipment Co., Benton Harbor, Mich.

Welding Machines, Resistance

Eisler Engineering Co., Inc., Newark, N. J.
Fier Equipt. Mfg. Co., Benton Harbor, Mich.

Wheel Pullers

Armstrong-Bray & Co., 815 N. Sheldon St., Chicago, Ill

Wheels, Grinding

Chicago Wheel & Mfg. Co., M.C. Tool Div., 116 S. Aberdeen St., Chicago, Ill

Woodworking Machinery

Tannewitz Works, Grand Rapids, Mich.

Worm Gear Motor Units

Star Mchs. & Eng. Co., Bloomfield, N. J.

Wrenches, Ratchet

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Boring mills, Baush 44" vert., m. d.
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Millers, plain, No. 1½ American; No. 3 B Owen vert. attach.; No. 3½ Fox; No. 2 Kempsmith.
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Presses, o. b. i. Nos. 1, 2, 3, 4 Loslbough-Jordan.
Punches, sgl. end. Cleveland "C" 26" thr. ⅞ in ⅞"; Rock River Style L rapid action, 24" thr. ½" in ½"; No. 6 L. & A. 24" thr. ½" in ½"; No. 7 L. & A. 10" thr. ⅝" in ⅝".
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Punch & shears, dble. end, No. L-10 Badger 10" thr. ⅝ in ⅝".
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Shapers, 26" Columbia & Queen City.
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Bor. mill, 36" Bullard, side hd., s.p.d.
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Boring mill, 48" Gisholt r.p.t., 2 hds.
Boring mill, 62" Betts, 2 heads, b. d.
Boring mill, 76" Bullard, 2 hds , b. d.
Boring mill, 12' Niles, 2 heads, b. d.
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Drill, 2 spindle Avey, b. b., m. d.
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Drill, 4-sp Colburn, table 20x72.
Drill, mult. 12 sp. Pratt & W., b. d.
Drill, hvy. duty, D-6, 36" Colburn.
Drills, radial, 2½', 4' & 6' Fosdick.
Drill, rad.(3), 5' N. B. P., mtr. on arm
Drill, radial, 6' Dreses, s. p. d.
Drill, radial, 4' Prentice, t. a., b. d.
Drills, upright 16" to 36"
Drill, Baker, table 23½x17", s. p. d. .
Drill, upright, No. 153 Baker, m. d.
Engine, gas, horiz., 20h.p. Bessemer.
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Gear cutters, 11", 18" & 24" Gleason.
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Grinder, emery, wet. wheel, 34x4".
Grinder, No. 2 B. & S., surf. b. d.
Grinders, plain, 6"x20", b. d.
Grinder, plain, 12"x42", b. d.
Grinder, sur. 14" Pratt & W., m. d.
Grinder, surf. 42" Spring., tbl. 18x84".
Grinder, surf. 48" Diamond, m. d.
Grinder, univ. No. 3 Landis, 12x40".
Hammer, Blacker, power, 35-lbs.
Hammer, power, 90-lb. Justice, b. d.
Hammers, No. 3-B Nazel.
Hammers, steam, 660 lb. to 6000 lbs.
Hammer, steam drop, 10,000 lb. Erie.
Lathe, 16"x6' Monarch grd. hd., s.p.d.
Lathe, 16"x8' L. & S. q. c. g., b. d.
Lathe, 24"x10' Reed, q. c. g., b. d.
Lathe, 24"x12' L. & S. q. c. g., t.a.b.d.
Lathe, 24"x16' Bridgeford, g.hd.m.d.
Lathe, 30"x18' LeBl., g.h., q.c.g., m.d.
Lathe, 32"x16' Pond, t. g., b. d.
Lathe, 36"x16' L. & S. grd. hd., s.p.d.
Lathe, 36"x18' Putnam, l.c.g., t.a.b.d.
Lathe, 38"x17' Pond, t. g., b. g.
Lathe, gun boring 49"x82', m. d.
Lathe, tur. No. 2-B Foster univ. m.d.
Lathe, turret, No. 6 Warner & S.
Lathe, turret, 18" Libby, m. d.
Lathe, turret, 24" Steinle, 6½" hole.
Lathe, spinning, 32"x6' Bliss, b. d.
Miller, pl., No. 2 Kempsmith, b. d.
Millers, pl. Nos. 2A, 2B & 3B Milw.
Miller, pl., No. 24 B. & S. tbl. 17"x72"
Miller, pl., No. 28 Ohio, tbl. 52x11½.
Miller, rotary 40" Ohio, tilted.
Miller, univ. No. 3 Kempsmith, b.d.
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Planer, 36x36"x18' Gray, 3 hds., m.d.
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Pl., 56"x48"x12' Det. & H., rev. m.d.
Planer, 60"x60"x16' Pond, 4 hds. m.d.
Planer, 96"x96"x33' 4 hds. rev. m. d.
Press, arbor, No. 17 Green., 18-ton.
Press, No. 3 Bliss, Stiles type.
Press, cam, No. 69N Bliss, dbl act. inc.
Press, o. b. i. Bliss, Nos. 18, 19, 20.
Presses, Nos. 4 & 5 Nia., 2 & 2½" st.
Press, P-5 Ferracute, stroke 3", m.d.
Press, No. 55 Toledo 20"x19", 2½" st.
Press, No. 64 Cons., 17"x17", str. 4½".
Press, No. 57 Toledo, 32"x32", str. 6".
Press, Toledo No. 59, 8" stroke.
Press, dbl. crank No. 5 Bliss, 2" str.
Press, screw, No. 87 Niagara.
Press, hand screw, No. 192 Tol. dbl.
Press, hyd., 200-ton Oilgear, 4 post.
Press, forging, United 1000 ton hyd.
Punch & s., No. 5-H Bertsch hand.
Riveters, air, hammer, spinning.
Rolling mill, 9"x18", m. d.
Roll, bending, Wickes 10'x½".
Roll, bending, 8'x½" Bertsch, b. d.
Roll, angle bending, 2"x2"x¼", m. d.
Saws, friction, Nos. 2, 3 & 4 Ryerson.
Saw, cold, No. 6 Coch.-Bly, a. p. d.
Shaper, vert., Jones 10" stroke, m.d.
Shaper, 20" N.-B.-P. trav. hd., m d.
Shapers, 16", 20", 24" & 36" G. & E.
Shear, angle, 6"x6"x1" H. & J.
Shears, alligator, 1½", 2", 3" & 4".
Shear, alligator, No. 18 Carlin, cap. 2½"
Shear, bevel, Lennox ⅜", b. d.
Shear, cir. & flan. No. 208A Nia.
Shear, guil. No. 5 H. & J. 4" sq., m.d.
Shear, open end, No. 17 K. New Doty, 4½" rd.
Shear, sq. 10"x18 ga. Niagara, m. d.
Shear, sq., 12'x14 ga, Peerless, b. d.
Shear, 12'x¼" Wheeling, 31" gap.
Shear, 16'x¼" L. & A., 20" gap m.d.
Shear, slit., O. F. cap. ¼", 14" blade.
Shear, Pels, BLUEFG-20.13/16"-4".
Sheet metal cut., No. 1 & 1-A Gray.
Slotter, 6" Newton, 21" table, m. d.
Slotter, 18" Dill.
Straightener, 2-A Kane & R. 20-roll.
Straightener, 1½", 4" rd. Abramson.
Welder, spot, 40 k.w. Thom. 2 pcs. ⅜"

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4 Cone ⅞" threading spindle.
3 Cone 1⅛".
1 Cone 1".
Cleveland, 1¼" model B.
Cleveland, 1¼" model B magazine.
Cleveland, 2" model C.
Cleveland, 2" model B.
Cleveland, 1" model J.
Cleveland, 4½" model A.
Cleveland, 5½" model A.
Cleveland, 4 spindle model M.
New Britains, ⅝" 5 spindle.

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Scott-Bansbach Machinery Co., 4607 West 20th St., Chicago, Ill.

Miller, No. 1, Burke, hand, dividing head	$ 90.
Miller, Wisconsin hand, on pedestal, 12"x4' x6½"	125.
Miller, No. 2, Becker, vertical, arranged m. d.	375.
Miller, No. 2H B. & S. plain, cone type, with vise, c/s and arbors	400.
Miller, No. 5, B. & S. plain, cone drive, capacity 48x12x18	750.
Miller, No. 7 Becker, Lincoln type	75.
Motor, 20 h.p. Fairbanks, slip ring, 220, 60, 3, 360 to 720 r.p.m., compl.	150.
Motor, 20 h. p. Marble card. 220 v., 60 cy., 3 ph., 1200 r.p.m., complete	175.
Motor, 20 h. p. G. E., 220 v., 60 cy., 3 ph., 1145 r. p. m., complete	175.
Motor, 25 h.p. Wagner, 220 volts, 60 cycle, 3 phase, 1140 r. p m.	200.
Planer, 17"x18"x3' 6", no name, 1 head	150.
Planer, 24x24x6 Ohio heavy duty, 1 head	250.
Planer, 72x72x12 Gray, 4 heads	1,500.
Press, No. 4 Greenard with ratchet, floor type, adjustable table	85.
Press, No. 0 Hercules, bench type, ⅞" str., 115 lbs. Fly Wheel 25 lbs.	50.
Press, No. 2, Thomas, o. b. i., 2" stroke, 15 tons, 1600 lbs	175.
Press, No. 20 Bliss o. b. i. 2½" stroke, 28 ton, 2300 lbs	250.
Press, No. 21 Bliss o. b. i., 2" stroke, 37 ton, 4200 lbs	250.
Press, No. 75 Cons. gap frame, comb. grd. 2" stroke' 65 ton, 11000 lbs.	700.
Press, No. 2 solid back, 1½" stroke. 25 ton, 1500 lbs	100.
Press, No. 51 Toledo arch, 2½" stroke, 56 ton, 5300 lbs	350.
Press, 19S, Robinson, dbl., cr., pl..3" str., gap type, bet. 37", arr. m. d.	350.
Punch, shear and bender, No. 23 Armstrong-Blum	100.
Punch, Kneeland, 10" throat, shears 5"x1" flats	100.
Riveter, Grant, spinner, No. 80-A, horn table ½" capacity	75.
Riveter, No. 3 A, H. D. High speed hammer, cap. ½", belt driven	150.
Rivetcr, No. 4A, High speed hammer, ⅝" capacity, no ctrsft	200.
Riveter No. 5 A, High speed hammer, cap. ¾", motor shelf	275.
Roll, Niagara, 3" dia. x 52" long, back geared, belt drive	100.
Saw, No. 2 Klem, band, for metal cutting, belt drive	300.
Saw, Napier, model B, band, for metal cutting, belt drive	300.
Scleroscope, Shore complete with stand and blocks, model C	125.
Screw machine, No. 0, B. & S., wire feed, ⅞"x2½" capacity	250.
Screw machine, No. 2 Foster friction head	150.
Screw machine, No. 3 Acme friction head	150.
Shear, 30" Bertsch, 16 gauge, 12" gap, foot power	75.
Shear, 10" Niagara circle, No. 20 gauge, cuts 58" dia. circle	40.
Shear, No. 16, Niagara, circle, 16 ga., 72" circle, belt drive	75.
Separator, National, oil, 11 quart capacity	50.
Shaper, 12" Gould & Eberhardt, singlecrank vise and countershaft	135.
Shaper, 16" Steptoe, back geared, crank, vise and countershaft	250.
Shaper, 16" Smith & Mills, back geared crank, vise and countershaft	250.
Shaper, 24" Walcott, H. D., back geared crank, vise and c/s	400.
Tapper, No. 1 Garvin Automatic, capacity ⅝" iron, ½ steel	75.
Tapper, R. & S., ⅞" capacity, horizontal, on pedestal	75.
Threader, 1" Acme bolt and pipe, belt drive	125.
Turret lathe, 2½x10" Milholland, for chuck and bar work	400.
Vertical attachment for No. 2 Brown & Sharpe miller	100.
Welder, butt, Toledo, 8 KW., capacity ½" round	150.
Wire straightener, Shuster, 3/16" capacity, 8 foot carriage	250.

FOR SALE BY

Marr-Galbreath Machinery Co., 55 Water St., Pittsburgh, Pa.

Quality Not Reflected in These Low Prices.

Air comp., 17"x10" Ing.-R., 45 lbs.
Air comp., 12"x10" Bury, belted.
Air compressor, 5"x5" Ing.-R., m.d.
Air compressor, portable ½, 3 and 5 h. p.
Bender & straightener, No. 4 H. & J.
Blower, No. 1 Am., 74½ CFM No. 2.
Blower, 4 E. Buffalo 1/60/220.
Blower, No. 3 Root, 2500 c. f. m., 12" outlet, 16 oz. pressure.
Bolt threader 4" Geometric b. or m. d.
Bolt threader, 2½" Landis dbl., m. d.
Boring mill, 30" Colburn, turret hd.
Boring mill, 30" Bullard V T L, threading attachment.
Boring mill, floor, 6" bar N. B. P., 230 v. d. c., 2 column.
Brakes, hand, 4'x14 ga. Robinson
Brakes, hand, 6'x16 ga. Keene.
Bulldozer, No. 6 W.-W., clutch, b. d.
Bulldozer, No. 22, W.-W., m. d.
Crusher, Allis-Chalmers, 9x9", 2-roll, belt drive.
Die sinker, No. 3 P. & W., r. t.
Driller, 5, 6-sp. Detroit, chucks.
Drill, 5, 6 spdl. L.-G., b. b., m. d.
Drill, radial, 3½' Cin-Bick. t. a., m. d.
Gear cutter, 18" Newark, (cheap).
Generator, 125 k. v. a. 3/60/220/900.
Grinder, No. 2 B. & S. chuck, b. d.
Grinder, Nos. 1, 1½ & 2, tool & cut.
Grinder, face, 84"-30" wheel, mag. chuck, m. d.
Grinder, 7½h.p., U.S. dbl. end, 3/60/440
Grinder, surf., No. 2 B. & S., m. d., magnetic chuck.
Grinder, pl. 11 B. & S. 4x30" (cheap).
Hack saw, 6"x6" Marvel, belted.
Hammer, 2001b. Beaudry, power.
Hammer, 500 lb. Erie SF steam or air.
Hammer, Syntron Elec., 1/60/110/.
Hammer, No. 2B Nazel, motor dr.
Hammer, 400 lb. Bliss board drop, b. d.
Header, cold, ⅜" W.-F. D. S.-OD.
Hoist, chain, 4-ton triplex, Y. & F.
Jointer, bench, 4" Wallace ¼ h.p. mtr.
Keyseater, No. 2 Catlin, cap. 2"x18".
Lathe, 36"x16' L. & S. g. h., m. d.
Lathe, 27"x12' New Haven, $150.
Lathe, Fox Monitor, 18"x6' Springfi.
Lathe, 16"x6' L. & S., g, h., ta., m. d.
Lathe, 11" Sundstrand, g. h., s. p. d.
Lathe, 24"x14' Hendey, g. c. g., tie-b.
Lathe, turret, No. 4 W. & S., bar feed, m. d. (2).
Lathe, 12"x8' R. P., g. h., s. p. d.
Lathe, 18"x8' L. & S., q. c. g., t. a.
Lathe, 32"x16' Bridgeford g. h., m. d.
Lathe, 20"x8' Hendey, tie bar.
Lathe, 14"x19" Fay automatic.
Miller, hand, No. 1 U. S. (2).
Miller, plain 1-y B. & S., rack feed.
Miller, No. 4 Hendey, Lincoln type.
Miller, No. 4 Ohio table 101".
Pipe machine, 12" Cox., b. d.
Planer, Gray, 56x48x10', 4 heads.
Planer, 30"x30"x10' Liberty, 2-h. m. d.
Planer, 48"x48"x10' Gray, 3-hds., b. d.
Press, No. 61, Bliss, reducing 5" stroke.
Press, Arbor, No. 8 Greenerd, hand
Press, 30-ton Lourie hydraulic.
Press, Arch, No. 3A Mossberg dial feed, 12 positions.
Press, horn, 42-h. p. Toledo.
Press, trimming 58½ Toledo d. b. g., 10" stroke, friction clutch, m. d.
Presses, o. b. i., 19 Bliss, 4" str.
Press, No. 83 Bliss redu., bg., 10" str
Press, hydraulic 200 ton oil gear pump m. d., rapid ac., 10" st., bed 24x16".
Punch, Pels-C3LU-21, triple gag, m. d.
Punch, SE., 24" tht. ⅝"x¼", m. d.
Punch & s., s. e., 24" tht. Cleve. "C".
Punch & s., 25x24 U. Buf. univ., m. d.
Rolls, 42"x3" Pexto, latch hsgs., hand.
Rolls, bend., 10'x¼" H. & J., d. e. m d
Sandblasts, Pangborn AU-3 & AA-1.
Sandblast, Leiman, size A-1.
Screw machine, No. 2 P. & S. plain.
Shaper, 20" G. & E. b. g., hi. duty, belt drive.
Shaper, 21" Smith & Mills.
Shaper, 24" Barker b. g. V-ram, b. d.
Shaper, 24" Gould & Eberhardt, b. g., high duty, b. d.
Shear, Pels-Coping EAT-45 m. d. (2).
Shear, slit'g, Buffalo 24-S (Armor pl.)
Shear, squaring, 30"x12 ga., corrugated blades.
Shear, squaring, 10'x16 ga. Ohl.
Shear, plate, 16'x¼" L. & A. 20" gap.
Shear, 42"x¼" Nia., 18" gap. (Rebuilt).
Steam turbines, 100 h. p. 900 rev (2).
Unisheat, 36" throat, 14 ga., m. d.
Welder, Arc 200 amp. belted,
Welder, Arc 300 amp. 3/60/220.
Welders, arc, 35 amp., transformer,
Welding & cutting generator, Carbic

Partial List. Get Our New Complete Stock List.

FOR SALE BY

Thomas H. Craig, Jr., • 41 Mountfort St., Bridgeport, Conn.

Flywheel press, Waterbury-Farrel No. 50, like new ..... $ 375.
Header, o. d., s. s., Waterbury-Farrel No. 4 ..... 1000.
Lathe, 16"x10' Hendey, yoke head ..... 650.
Lathe, 16"x8' Cisco, quick change gear ..... 250.
Miller, hand, Whitney No. 6 ..... 100.
Production polishing and finishing machine, type A ..... 475.

FOR SALE BY

International Machinery Co., 3178 Bellevue Ave., Detroit, Mich.

MILLS

No. 3 Cincinnati univ., comp., cone.
No. 4 Cincinnati plain, s. p. d.
18" Cincinnati automatic.
15" Garvin vertical.
2B Brown & Sharpe plain, m. d.

GRINDERS

No. 2 Diamond surface, m. d.
No. 3 Brown & S. univ., complete.
No. 10 Brown & S. plain, s. p. d.
14" Pratt & W. vert., b. b. spindle.
84" Diamond face, 45 h. p., a. c. mtr.

DRILLS

3 spindle, 2B Edlund, power feed.
No. 13 Pratt & Whitney multiple.
4 spindle, 24" Barnes all geared.
Leland & G. single sp., h. s., b. b.
Natco multiple, all sizes.

MISCELLANEOUS

E. A. T. 45 Pels coping, m. d.
10' 3/16" cap. Streine shear, 18" gap, m. d.
No. 3-A Warner & Swasey, s. p. d.
No. 6 Warner & Swasey, power feed to cross slide and turret.
No. 4 Warner & Swasey, friction head, power feed to cross slide.
No. 4 Warner & Swasey, geared hd.
18"x8' Hendey, taper attach., cone.
75 k. w. Federal butt welder. 440 v.
10" Pratt & W. vert. slotter, m. d.
No. 0 Baker keyseater, m. d.
18" Gleason spiral finishers.
Cleveland model N, ¾" to 1-1/16", 4 spindle with magazine fd., m. d.

FOR SALE BY

Ott Machinery Sales, Inc., • 548 Second Ave., Detroit, Mich.

Automatics, B. & S. Nos. 00, 0, 2; Cleveland Model A 1¼, 2½ & 2¾"; Fay 14"x19"; Acme Nos. 52 & 54; Gridley, 4 spdl. ¾", 1⅛", 1⅜" & 2¼".
Drills, h s., b.b. Allen, Avey, Leland & Gifford 4-spindle No. 2; also power feed.
Drill, rad. Prentice 4'; American 5'.
Elec. h. s. furnace, Hoskins 12x8x16".
Gear shapers Fellows Nos. 6, 61, 7, 712 and 75 high speed.
Gear generators, Gleason 8" mfg. st. bevel; Gleason 15" spiral bevel, roughers and finishers No. 5A Lees-Bradner.
Grinders, Brown & S No. 10 s.p. d.; No. 2 B. & S., univ. & surface; Cincinnati No. 3 univ. 12x48"; Norton plain 6x32", 10-14"x50"; Norton crank pin No. B-81, 14"x36" and 48"; Norton crank pin type No. 80, 16"x72".
Lathes, Monarch 14"x8' q.c.; Springfield 16"x6' relieving and taper attach.; Hendey, 16"x8'; Flather 16"x6 ;'Hamilton g.h 16"x9'
Lathes, turret, Acme 3½"x36" g. h ; J. & L. 2"x24" & 3"x36"; Warner & Swasey Nos. 2, 4 & 6.
Milling machines, Cleveland No. 2 universal; Cin'ti plain Nos. 2 & 4 high power; LeBlond No. 4 plain cone; Kempsmith Nos. 12 and 33 Mfg ; Model B Becker vertical; Garvin No. 15, vertical spindle.
Planers, Cincinnati 26x26x8' 1-head; Cin'ti 60"x60"x20' 3-heads, m. d.;
Presses, Ferracute P2, 3 and 4, and D G 53; Bliss, s. s., s. c. No. 48, 73½, 79½ & 514; Toledo, No. 59½; 8" stroke; Bliss d.c. Toggle No 495B, 407A, 408B, & 412; Adriance toggle No. 14, 7 & 14" strokes; Ferracute s. s., s. c., 32" bu. 6" shaft. 12" str.; Stoll DCSS 54" bu. 5½" shaft; Lucas 50 ton horizontal; Metalwood 30 ton hydraulic.
Punch & s., Kling No. 4, d.e., 24" thr.
Roller Leveller, McKay 48", 17-3½' rolls.

USED AND REBUILT MACHINERY

FOR SALE BY

Columbia Machinery Co., 130 E. Columbia St., Fort Wayne, Ind.

Automatics: No. 2 Brown & Sharpe; 1½ & 2½ Gridleys, 4-spdl., 3½ single spdl.
Drills, Allen 6-spindle, m. d.; 21" Barnes, self-oiling, m. d.; 26" Barnes, self-oiling; Leland-Gifford, 1-spindle, m. d.; Leland-Gifford, 4-spindle, m. d., 2 p. f., 2 tap hds.; No. 12 Natco, h. s., b. b.; 21" Rockford, 4-spindle, m. d.
Grinders: Bryant, Nos. 15 and 20; Hanson-Whitney tap; Heald No. 75, clutch head; 10x36 Landis, m. d.; 6x32 Norton, m. d.; Woods tool and cutter.
Lathes: 12x5 Adams short cut; 18x8 Chard; 16x8 Pratt & Whitney, taper and relieving attach.; 16x5 Prentice, grd. hd., m. d.; 14x5 Sidney, quick change gear; Nos. 4 and 6 Warner & Swasey; 18x8 Wolcot, quick change gear.
Millers: Becker 5C, vertical; No. 1½ Brown & Sharpe universal, m. d.; No. 4 Cincinnati universal, cone drive; No. 4 Cincinnati plain, cone drive, r. p., traverse; Nos. 2 and 3 Ryerson-Conradson, pl., s.p.d.; U. S. 2-sp. hand mill.

MISCELLANEOUS

Foot shears, 30" and 36".
Forcing presses, 15 & 30-ton Lucas.
Gear rougher, G. & E. 3-spindle.
Generators, straight tooth, 6" and 18" Gleason.
Keyseaters, Baker and No. 2 Davis
Hand brakes, 4, 6 and 8'.
Planer, 24x6 Flather.
Power shear, 4', 10-gauge.
Tapper, Garvin 2X.

FOR SALE BY

Belyea Company, Inc., 150 W. 18th St., New York, N. Y.

D. C. MOTORS
Adj. Speed—230 Volt

H. P.	TYPE	SPEED
1—1500	West.	470/ 600
1— 250/410	Cr. Wh.	1000/1200
2— 150	G. E.	1000/1200
2— 125	West.	240/ 600
2— 120	G. E.	300/ 750
3— 80	Diehl	500/1100
1— 75	G. E.	300/ 800
2— 60	El. Dy.	450/1200
5— 60	El. Dy.	525/1050
2— 50	West.	225/ 600
1— 40/50	Cr. Wh.	175/ 700
1— 40	West.	300/ 900
1— 40	West.	600/1200
1— 35	Cr. Wh.	800/1600
12— 25	West.	650/2200
2— 20	West.	375/1500
1— 20	West.	550/1100
2— 20	G. E.	500/1500
20— 10	West.	500/1500
25— 7½	West.	400/1600
26— 5	West.	400/1600
1— 5½	West.	600/1800
10— 3½	West.	450/1800
15— 2½	West.	450/1800

MOTOR GEN. SETS.

1—1500 k. w., G. E., type-M. P. C., D. C. Gen. 250 v., com'd inter pole, conn. to 2150 h. p., 8 P. F., type ATI, synch. motor, 11,431/6600 v., 360 r. p. m., 3 ph. 60 cy.
1—1000 k. w., G. E. type-M. P. C., D. C. Gen. 250 v., conn. to 1400 h. p. type ATI, synch. motor, 6600/2300 v., 514 r. p. m., 3 ph. 60 cycle.
1—500 k. w. West. D. C. Gen. 250 v., conn. to 710 h. p., 8 P. F. synch. motor 4600/2200 v., 1200 r. p. m., 3 phase, 60 cycle.
1—200 k. w., Crocker Wheeler type 149DA comp'd. inter pole, 250 v., D. C., conn. to 30 h.p., Sq. Cage, A. C. motor, 2300/440 v., 720 r. p. m., 3 ph., 60 cy.

A. C. MOTORS
Synch. Type

H. P.	TYPE	VOLTS	SPEED
1—2850	G. E.	2300/4150	450
1— 675	Al. Ch.	2200/ 550	900
1— 600	G. E.	2200/ 550	257
1— 260	Al. Ch.	2200/ 440	720
1— 125	West.	2300	900
1— 50	G. E.	440/220	1200
1— 35	G. E.	440/220	1200

SLIP RING

1—1200	West.	2200	360
1— 600	G. E.	2300/550	257
1— 600	G. E.	2300/440	705
1—450/360	West.	2200	875/700
1— 400	West.	2300	514
1— 400	West.	550	505
1— 300	G. E.	550	575
1— 250	F. Morse	2200	1200
1— 250	West.	2300/440	700
2— 200	West.	220/440	900
1— 200	G. E.	220/440	900
1— 150	G. E.	440	1750

SQUIRREL CAGE TYPE

1— 300	Cr. Wh.	2300/220	580
1— 250	West.	2300/440	580
1— 150	G. E.	220/440	900
1— 150	West.	220/440	720
1— 150	West.	220/440	580

Above is Only Partial Listing. We Specialize in All Electrical Equipment, Motors, Pumps, Generators.

FOR SALE BY

J. Bieser Mfg. & Machy. Co., 16th & Madison St., Springfield, Ill.

Air comp., 6x6 Ingersoll-Rand	$ 130.	Miller, No. 2 Garvin univ.	$ 195.
Knife grinder, 79"	125.	Punch, Cleveland, ½"x¾"	195.
Lathe, 36"x18' L. & S., m. d.	1500.	Radial drill, 7' Bement	325.
Lathe, 18x8 Prentice q. c.	325.	Shaper, 20" Smith & Mills	175.
Miller, No. 3 H LeBlond	500.	Trip hammer, 50 lb. L. Giant	85.

FOR SALE BY

Ohio Machinery & Supply Co., 433 E. Pearl St., Cincinnati, Ohio

Boring mill, Rudolph & Krummel horizontal, 2¾" bar ..... $ 325.
Radial drill, Canedy-Otto, 3½' wall ..... 75.
Drills, Superior, 24" s. h. b. g., t. a. ..... 185.
Lathes, Sebastian 14"x5' geared head, L. C ..... 200.
Lathes, Schumacher-Boye 18"x6 q. c. ..... 200.
Millers, Garvin 14A, plain with vise and c. s. ..... 175.
Millers, LeBlond No. 3 plain vise and c. s. ..... 225.
Rotary shears, Pettingell, 30" throat ..... 100.
Turret lathe, Acme 18" swing, lot of equipment ..... 150.

Above only a few of our bargains. Let us have your inquiries.

FOR SALE BY

Sampson Tool Company, Inc.
101 Walker Street, - - - - New York, N. Y.

Used Machinery Dep't.

Yoder gang slitter, 36" with table, 12 cutters, 10 h. p. General Electric a. c. motor, switch box. Good as new.
Steel plate slitting shear, angle iron and bar cutter. Cuts sheets, 5/16" angles and tees 2x¾", rounds 1".
No. 2 Bardon & Oliver hand screw machine, 1", back geared, friction head, adjustment to cross slide, rod feed and countershaft.
Worthington air compressor, size 8. 5x6. 100 lbs. pressure.
225 K. V. A., G. E. generator, 3-phase, 600 cycles, 600 r. p. m., with direct connected exciter switchboard and field regulator.
Gotterman single spindle automatic tapper, serial No. 8-225, size ¾" to 1". driven by 1½ h. p. 3-phase, 60 cycle, 440 volts, 1750 r. p. m. Used slightly.
4-spindle Globe tappers, automatic, serial No. D-11, arranged for 16" dial feed.

FOR SALE BY

M. A. Wertman Machinery Co., 623 Penton Bldg., Cleveland, Ohio

Automatic, ⅞" cone, m. d.
Automatic, No. 00 Brown & Sharpe.
Automatic, 1½"-B Cleveland.
Broach, No. 3 LaPointe, double.
Boring mill, 42" N. B. P., (2).
Drill, No. 216 Baker hy. service (2).
Drill, 6-spindle Moline D-13.
Drill, 4-spindle Barnes (2).
Drill, Natco, 14-B, rect. head.
Drill, Bausch 8-spindle No. 4, m. t.
Die sinker, Keller E-6.
Gear cutter, No. 4, 36" Brown & S.
Grinder, No. 11 Brown & S., s. p. d.
Grinder, No. 2 Brown & S. univ.
Grinder, No. 17 Besley, b. b.
Grinder, No. 3 W. & M., surface.
Lathe, 14" x8' Cisco, q. c. g.
Lathe, 36"x12' Bradford 90% new.
Miller, No. 33 Brown & S. auto.
Miller, No. 3 Kempsmith univ.
Miller, No. 4 Cincinnati, m. d.
Nut tapper, ¾" Acme, late type.
Planer, 24"x6' Gray, like new.
Press, No. 27G Stoll horning, m. d.
Press, No. 5 Bliss, punch, 90% new.
Press, No. 24 V. & O., punch, 90% new.
Swager, No. 3 Langelier, 98% new.
Turret lathe, H-21" Gisholt 3⅜".
Turret lathe, 1-24" Gisholt 6¾".
Turret lathe, 4-L Gisholt 10½", m. d.

SPECIAL—30"x12' Ingersoll adjustable rail miller, 3 heads, m. d.

FOR SALE BY

The E. L. Essley Machinery Co.

Telephone Lincoln 6320 - - - 831 Rees St., Chicago

Boring bar, Cleveland, 2½" spindle.
Boring mill, 54" Colburn, vertical.
Drill, radial, 4' Amer., motor on arm.
Grinder, No. 1 Le Blond tool & cut.
Lathe, 18"x8' Lodge & Shipley.
Miller, No. ½ Van Norman.
Press, No. 6 Niagara, open back.
Press, No. 22 Bliss, roll feed.
Shear, Nia. No.407-A, ring & circle.
Shear, Niagara, 42", No. 14 ga.
Shear, Niagara, 10', No. 14 ga.
Shear, Niagara, 10', No. 18 ga.

FOR SALE BY

The O'Brien Machinery Co., 113 N. Third St., Philadelphia, Pa.

Boring mill, 24" Bullard, rap. prod., threading attachment.
Boring mill, 3½" bar Gidding & Lewis horiz. table 23"x45".
Drill, 3½' Cin.-Bick. radial, s. p. d.
Grinder, No. 55 Heald.
Grinder, No. 2 Van Norman piston.
Grinder, 10"x52" Landis, self contained, plain.
Hammer, 800 lb. Erie, steam forging.
Hammer, 1100 lb. NBP. steam forg.
Hammer, 2000 lb. Chambersburg double frame steam.
Lathe, 24"x10' Greaves-Klusman, belt drive, quick change.
Lathe, 28"—48"x12' Harrington gap belt drive, with equip.
Lathe, 24"x12' Reed-Prentice, s.p.d.
Lathe, 66"x38' Bement, motor drive.
Miller, No. 1½ Cincinnati Univ. tbl. 36"x9", belt drive.
Miller, No. 3 K. & T., univ. table 55"x15", range 34"x12"x19",
Miller, No. 1½ Rockford plain, belt drive, table 9"x38½"
Pipe machines, 2, 4, 6, 8 and 12" belt and motor drive.
Punch, No. 3 Southwark ¾x1¼", mtr.
Shapers, 14, 16, 20 & 24" various makes
Shear, 8' Niagara, 15" gap, 3-16" cap.

FOR SALE BY

Wm. C. Johnson & Sons Machinery Co.,

1211-1223 Hadley Street, St. Louis, Mo.

DRILLS AND RADIAL DRILLS.

3' arm Mueller.
4' arm Mueller.
5' Niles.
6' arm Prentice Bros.
24" Baker.
24" D 4 Colburn.
28" Barnes.

BORING AND TURNING MILLS.

36" Gisholt, turret head.
60" Colburn, 2 heads.
16'—16' Niles, motor driven.
36"—44" Niles, side head.
72" Betts, 2 heads.

BOLT THREADERS.

1½" Landis.
1½" Little Giant.
1½" Landis.
2" National.

BULLDOZERS.

Nos. 3, 4 and 8 Bulldozers.

GRINDERS.

10"x36" Thompson, universal.
16"x66" Landis.
24"x5' Springfield surface.
6'x12' Cylindrical.
12"x66" Landis.

LATHES.

14"x6' American, geared head.
18"x10' Schumacher & Boye.
26"x12' Flather.
26"x12' Blaisdell, q. c.
24"x16' Lodge & Shipley.
32"x15' F. E. Reed.
54"x29' Fifield.

MILLING MACHINES.

No. 2 Brown & Sharpe universal.
No. 4 Cincinnati.
No. 2A Kearney & Trecker.
U. S. Hand Miller.

USED AND REBUILT MACHINERY

FOR SALE BY

Brownell Machinery Co., - 150 Pine St., Providence, R. I.

Drill, 3' American radial.
Drill, 3 spindle b. b. Avey.
Lathe, 60"x30' Pond.
Lathe, 32"x28' New Haven.
Miller, No. 3 Hendey universal.
Miller, No. 3 Becker vertical.
Miller, No. 4 Cincinnati, vertical.
Shaper, 20" Gould & Eberhardt.
Screw mch. No. 4 B. & S., wire feed.

FOR SALE BY

Chas. E. Wain Machinery Sales, 7800 Mack Ave., Detroit, Mich.

Gates Tex Drive, 12 groove, 48' ..... $ 45.
Drill, 42" Barnes, b. g., t. a..... 300.
Drill, 20" Minster, 2" cap..... 650.
Drill, 24" Mechanics, b. g..... 125.
Drill, No. 13 P. & W. multiple $150.
Lathe, plain head 16x5..... 100.
Lathe, 24x14 ..... 225.
Mill, Lincoln ..... 75.
Rotary shear, 5' throat..... 40.

FOR SALE BY

Wigglesworth Machinery Company

199 Bent Street, - - - - Cambridge, Mass.

Boring mill, 36" Bullard New Era.
Boring mill, Cleveland 2½" bar.
Grinder, No. 2 Cincinnati, centerless.
Hammer, No. 6B Nazel.
Lathe, 26"x11' Greaves & K. grd. hd.
Miller, No. 1M Cincinnati univ.
Miller, No. 2-B Brown & Sharpe.
Miller, 5B heavy B. & S., rap. trav.
Miller, 24x24x12' Ingersoll, 3 heads.
Radial, 4' American.

Send for Complete Stock List.

FOR SALE BY

The Noble Machine Company, - - Fort Wayne, Indiana

Boring mills, 24" to 96".
Centering machine, 3" capacity.
Cornice brake and shears, 8', steel, No. 3 Bliss (Styles-Parkertype) m. d.
Drill, 24", Cincinnati s. h., b. g., p. f., also 28".
Drill, radial, 4' American, triple grd.
Grinder, Norton 6"x32", m. d., compl.
Lathe, Sidney 14x7, pan, collet att.
Lathes, LeBlond, 12"x5', c. r., (2).
Miller, 1½ & 4 Cincinnati, universal, dividing vertical heads.
Miller, 2-B Rock'd, univ., complete
Planers, 24" to 12'x30' long.
Punch & shear, 18" thru ¾" cap.
Punch & shear, W. & W., ¾" cap.
Shapers, 12" to 32".
Tube welder, Hartz, 2" to 6" cap.

We have over 1000 machines. Send for our list.

FOR SALE BY

John A. Stockman, - - - - Homesdale, Pa.

Automatic, 5½", Cleveland model A.
Boring mill, 72" Betts vertical, motor drive.
Drill, 7' Cincinnati Bickford super service, radial, 17" column, motor on arm.
Grinders, Covin Hatchett hydraulic service, No. 78, motor in base, (3).
Lathe, 28"x14' Lodge & Shipley q. c. g., taper attachment; complete with chuck and rests, cone drive.
Lathe, car wheel, 42" Pond.
Pipe machine, Crane 2" to 8", with dies.
Press, wheel, 300-ton Niles hydraulic.

FOR SALE BY

Standard Machinery, 321 Lake Michigan Dr., Grand Rapids, Mich.

Automatic, ⅞" Gridley Model G.
Autocall system No. 2510.
Drill, Allen 2 spindle b. b.
Drill, Baker 3" heavy duty.
Drill, Natco Model 05D multiple.
Lathe, 18x8 Monarch with turrets.
Lathe, No. 2 B. & O. turret (1").
Lathe, 24-36x8 South Bend gap bed.
Press, No. 267 Cons. Cam Drwg.
Welder, No. 259A12 T. Gibb. 60-440 v.

FOR SALE BY

Sexauer & Lemke, Inc.,

Vernon and Pierce Aves., - - Long Island City, N. Y.

Bolt cutter, 3" Acme, single head, with countershaft ..... $200.
Bolt cutter, dbl. hd. Acme, with Landis hds, comp. with countershft..... 250.
Drill presses, small, belt driven, (2)..... 20.
Drill press, Prentice, back geared..... 75.
Forging machine, bolt head, 1½" Ajax..... 300.
Hacksaw, No. 7 Robertson Economy..... 60.
Lathe, Niles, 22" swing, 12' bed, 20" chuck, 4-step cone, belt driven complete with countershaft..... 125.
Lathe, Prentice Bros.; 16"x8', 4-step cone, b. d., with countershaft..... 75.
Lathe, no name, 24"x10' with countershaft, has cabinet legs..... 50.
Miller, hand, no name..... 25.
Power hammer, Kane & Roach..... 50.

FOR SALE BY

Davis Machinery Co., St. Clair & Washington Sts., Toledo, Ohio

Compressor, air, 9 x 11 Chicago Pneumatic hor.
Drill, No. 310 Baker, hvy. duty.
Drill, W. F. & J. Barnes 20" 4 spdl.
Drill, No. 2 Avey 2-spdl. h. s., b. b.
Drill, Avey, 4-spdl. h. s., b. b.
Grinder, No. 4 Gardner dbl. end disc.
Grinder, No. 14 P. & W. vert. surf. b. b.
Grinder, No. 6 Gardner, b. b. dbl. end disc.
Grinder, No. 1½ Cinc. Tool & Cutter.
Lathe, 16"x6' Flathers, q. c. g.
Lathe, 18"x8' LeBlond, h.d., q. c. g.
Lathe, 16"x8' LeBlond, q. c. g.
Lathe, 28"x18' Pittsburgh, q. c. g.
Lathe, 11"x5' Seneca Falls, q. c. g.
Lathe, 16"x8' Hendey, q. c. g.
Lathe, No. 6 Warner & S., turret.
Mill, 24" Bullard vert. boring.
Mill, AB Becker vertical, s. p. d.
Mill, 18" Cincinnati automatic.
Mill, No. 2 Cin hi. power pl., s. p. d.
Mill, No. 2A Milwaukee, pl., s. p. d.
Shaper, 24" Potter & Johnston, crk.

FOR SALE BY

Reliance Machinery Sales Company

1405 Brighton Place, N. S. - - - - Pittsburgh, Pa.

Bulldozer, No. 9 Williams-White; 24" stroke, 48" die space, weight about 70,000 lbs.
Drill, 4 spdl. 20" Barnes, all geared.
Drill, 3 spindle, 26" Barnes, t. a.
Drill, 6 spindle Prentiss b. b., No. 2 Morse taper, power feed.
Drill & tap., No. 314 Baker, cap. 3".
Lathe, 48"x20' Betts-Bridge, grd. hd.
Lathes, spinning, No. 6 Bliss & 326 Toledo, roller bearing spindles.
Miller, No. 2AS Milwaukee, double over arm, single pulley drive.
Millers, vert., 5B and 5C Becker.
Planer, 36"x10' D. & H., openside.
Press, No. 2-W Bliss wiring.
Presses, No. 16 Bliss horning.
Presses, Nos. 18 and 19 Bliss, o b. i.
Presses, Nos. 1 & 1½ Bliss toggle,
Press, No. 3½C Bliss toggle.
Punch & shear, L. & A. cap. 1 thru 1", with angle blades, etc.
Shaper, 20" S. & M. single pulley.
Shaper, 36" G. & E. cone drive.
Screw machines, No. 53 Natl. Acme.

High Grade Machine Tools

Lathes

36"x14' Boye & Emmes, cone, q. c.
32"x12' Bradford cone, Loose Chge.: like new.
36"x20' Bradford cone, Loose Chge.
36"x30' Lodge & Shipley Grd. Hd., S. P. D.; like new.
24"x10' Hendey g. h., t. a., s. p. d.
36"x18' American g. h., s. p. d.
18"x10' Lodge & S. S. P. DGrd. Hd.
24"x10' Bradford Geared Head Taper, Arranged Motor Drive.
28"x48"x10' Harrington, Slid. Bed.
20"x10' American Grd. Hd. S. P. D.
20"x8' Am. Grd. Hd., M. D., late.

Grinders

10"x52" Landis self contained.
No. 2 Brown & Sharpe Universal.
No. 4A Landis Crankshaft.
16"x48" Landis Crankshaft.
16"x48" & 72" Landis Crankshaft.
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10"x52" Landis Plain, Self Con.
Rivett Internal Grinder.

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No. 6—60" Brown & Sharpe.
36BM Gould & E. Gear Rougher.
No. 3, 26" Brown & S. Gear Cutter.
No. 4, 48" Brown & Sharpe.
Nos. 1, 2, 4 Adams Farwell Gear Hb.
18-H Gould & Eberhardt Hobber.
6", 11", 18" Gleason Gear Generators.

Bolt and Pipe Threaders

2" Acme Bolt Cutter.
2" Landis Double-Spindle.

Boring Mills

42" Bullard S. P. D.
36"-44" Niles-Bement-Pond Side hd. Mill, Rapid Traverse.
42" Niles Boring Mills, 2 heads.
14' Betts, Cone Drive.
60" Niles Boring Mill, 2 heads.

Milling Machines

No. 4 Cincinnati High Power Vert., S. P. D.
No. 3 Cincinnati Universal, cone dr.
No. 1½ Becker Brainard Univ. cone dr.
No. 3A Brown & Sharpe Univ.
No. 4 Cinti. High Pwr. Univ. S.P.D.
No. 2 & 3 Kempsmith Plain, M. D.
No. 3 LeBlond H. D. Plain.
No. 3 Kempsmith Universal.
No. 2 Rockford Universal, complete.
No. 3-B Milwaukee Pl., Dbl. O. A.
5B Becker Vertical Mill.
5" Pratt & Whitney Automatic.
18" Cincinnati Plain Mfg. Miller.
Briggs Manufacturing Miller.
No. 7-H Becker Lincoln type.
No. 1 Knight Miller and Driller.

Planers

24"x24"x6' Gray self contained.
24"x6' Ohio.
24"x24"x14' Gray, box table.
42"x42"x10' Clevelsad Openside, 3 heads, A. C., M. D.
26"x26"x8' Cleveland Openside.

Radial and Upright Drills

24" Cincinnati Bickford Upright, tap.
2½, 3, 3½, 6' Cinci.-Bick. S. P. D.
3, 3½, 4 American Trip. Pur. S.P.D.
3' Bickford Plain, S. P. D.
No. 2 Colburn Mfg. H. D. 2-spindle.
No. 40 Natco Straight Line Multi.

Shapers

20" Ohio, motor driven.
16", 20", 24" G. & E., mtr. dr. thru g. b.
16", 20" and 24" G. & E., cone drive.

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No. 3-B LaPointe Broaching Mche.
80 lb. Bradley Cushion Helve Hammer
High Speed Riveting Hammers.
Nos. 1& 3 Baker Keyseating Mches.
No. 2 Mitts & Merrill Keyseater.
Nos. 1 & 2 Davis Keyseaters.
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15, 30 & 50 Ton Lucas Forcing Pr.
96A Toledo Double Crank Press
No. 163B Consolidated Dbl. Crank.
No. 1 & 2-X Garvin Tapping Mches.
No. 4 W. & S. Univ. Turret Lathe.
Nice Variety of Sizes of Presses.

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Size A, L. & A., 2" thru 1⅛", 36" throat, motor drive.
L. & A., 1½" thru 1", 36" T., m. d.
No. 2H & J., hor., 1" thru 1", 15" gap, motor drive.
No. 3 H. & J., 1½" thru 1"; Shear 2⅛" rd., 30 T., motor drive.
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No. 5 Beatty flyw., ¾" th u ½" m. d.
No. 11 Beatty h. duty, beam, 2½" str.
Rock River, ⅞" thru ¾", 36" T. m. d.
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No. 1 H. & I., bar shear, 1½" rd., m. d.
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No. 11 Whiting beam, 2—1" thru 1", motor drive.
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Nia. rotary shear, 16 gauge, hand pwr.
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No. 6½ H. & J., 1"x96", 36" thr., m. d.
Loy-Nawrath, 3/16"x10' back gauge, motor drive.

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D. & K., ⅜"x12' leaf brake, m. d.
Plate leveling roll, 1"x8'.
No. 2 H. & J. leveling roll, 50" wide.
Bending roll, ½"x10', m. d.

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No. 27—W-W. Bulldozer, b. d.
No. 9S W-W. Bulldozer, m. d.
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3—75 '. Bradley upright helve, b. d.
2—80 . Bradley upright helve, b. d.
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Allen, ⅝", 6" reach, 8 ⅝" gap, (2).
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Allen, ⅞", 8" reach, 8" gap (3).
Hanna, ⅞", 8" reach, 8¼" gap, (2).
Hanna, ⅞", 8" reach, 13½" gap.
Allen, ⅞", 8" reach, 13-⅜" gap, (2).
Allen, ⅞", 34" reach, 15" gap.
Allen, ⅞", 47" reach, 15" gap, (2).
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Gould triplex, 8"x5", 2" suction, 2" disc., motor drive.
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MISCELLANEOUS

14½ G Metropolitan steam injectors.
No. 6 Sturtevant blower.
No. 8 Sturtevent blower.
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Columbus pipe thread, 6".
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150-ton Putnam wheel press.
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24" Cin. pl. Auto., m. d., late.
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10" Pratt & W. spur & hel. gear hyd. feed, 3 motor drive, like new.
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16"x8' American.
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16"x6' Lodge & Shipley.
18"x6' Monarch.
18"x8' Lodge & Shipley.
20"x6' Hendey.
21"x10' LeBlond, taper.
24"x8' Amer., 12 spd., auto oiled, tap.
24"x14' Am., 12 spd., auto oiled, tap.
24"x20' Amer., 12 spd., auto oiled, t.
18—36"x16' Rahn-L. Slid. bed gap, m. d., taper.
20"x8' American.
20"x10' American.
30"x12" American.
30"x18' LeBlond.
30" raised to 41"x12' American.
32" raised to 41"x28' Bridgdford, taper.

SHAPERS

28" Averbeck, single pulley drive, balanced ram.
24" American, m. d.
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28" Ohio, cone.
16" Springfield, m. d.
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16" American, m. d.

TURRET LATHES AND SCREW MACHINES

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Nos. 4, 6, 8 Warner & S. turret.
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Nos. 4, 7 Bardons & Oliver turret.
Nos. 2, 4 Foster turret.
Nos. 23, 24 New Britain automatics.
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21", 24", 28" Gisholt turret.

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Ingersoll 24"x24"x12' slab, m. d.
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Toledo No. 669, 2000 ton knuckle joint coining press tie rod, m. d.

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Pittsburgh 50"x33' grd. hd., g. c. g., var. spd. m. d., rapid. tr.
Pittsburgh 50"x30' grd. hd., q. c. g., 2 carriages, var. spd., m. d.
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Pittsburgh 36"x38' g. h., two carr. m. d., (2).
Pittsburgh 36"x28' q.c.g., g.d., two carr., m. d.
Putnam 36"x26' g. h., 2 carr., m. d.
Putnam 36"x28' 3 step cone, q. c. g., d. b. g., (10).
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American 36"x21' g.h.taper att.,m.d.
Lodge & S. 24"x24' d. b. g., q. c. g., 3 step cone.

MISCELLANEOUS

Morton 48" draw Cut Shaper.
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Rowbottom Cam Miller.
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G. & E. 12', 1½ d. p. cap. Rack Cut,
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No. 53 and 55 National Acme.
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1⅛" & 1¼" Gridleys model F.

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3½" D. & H. floor type.
3" Lucas gear box, s. p. d.
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48" Colburn, p. r. t. self contained.
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6' N. B. P. right line a. c., m. d.
6' Mueller, gear box, m. d.
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3' American, gear box, s. p. d.

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4 Spindle Barnes 22½" heavy duty.
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19 and 8 spindle Baush multiple.

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30" Aurora, 26" Barnes, 24" R. P.

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103"x20" G. & E.
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36" Fellows No. 6 shaper.
6" and 8" Gleason bevel (17).

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300 lb. Beaudry, m d.
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200 lb. Bradley, cushioned heive.

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14"x6' Monarch, q. c. g., cone.
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16"x6' American, grd. hd., m. d.
18"/36"x10' LeBlond gap, cone.
20"x10' SB & E, cone.
24"x12' Putnam, q. c. g., cone.
24"x16' Milwaukee t. a., cone.
32"x12' Bridgeford, grd. hd., q. c.g.
36"x26' L. & S., q. c. g., cone.
36"x30' Bridgeford, grd. hd.
36"x32' LeBlond, cone, 2 carriage.
30"/58"x14'—21' Putnam gap.
50"x30' Pittsburgh, grd. hd., 2 car.
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Taylor & Fenn, s. p. d.
No. 2 Knight, power feed.
No. 14 Garvin, table 20x48.

MILLERS, Production
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MILLERS, Plain
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No. 3 Hendey, cone.
No. 2B Milwaukee, grd. hd. (2).
No. 2 Kempsmith, cone.

MILLERS, Universal
Nos. 1 & 1½ B. & S., cone.
No. 3 LeBlond, cone.

MILLERS, Planer Type
Ingersoll adj. rail, 32"x12'.

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18", 12" & 8" Saunders.
8" Jarecki, gear box, m. d.
6" Williams Rapiduction, m. d.
2" Landis, cone.
2" Bignall & Keeler, m. d.

PLANERS
48"x36"x16', N. B. P., box table.
24"x24"x6' Cincinnati, m. d.
17"x17"x4' Whitcomb, m. d.

SHAPERS
24" Stockbridge, a. c., m. d.
20" Rockford, gear box, m. d.
16" Gould & Eberhardt, cone.

PRESSES
Nos. 40 and 50 Perkins, o.b.i., flyw.
No. 3A Emmes arbor press.
No. 44 Adriance o.b.i., dbl. act. cam.
200 Ton Niles 48" hyd. carwheel.
15 ton Lucas, forcing.

PUNCH
No. 1 H. & J., double end.

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36"x14 gauge Niagara.

SLOTTER
18" Newton, equal new.

SAWS
6" Peerless univ., shaping.
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9"x9" Peerless hack.

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10'x½" Bertsch Pyr.
16'x1¼" Wickes Pyramid Type.

TURRET LATHES
3A Warner & Swasey.
No. 6 and 4 Warner & Swasey.
No. 14 W. & S. heavy 1" capacity.
No. 2 Bardons & Oliver, 1" capacity.
1½"x15" Pratt & Whitney.
2x24 and 3x36 Jones & Lamson.
14" Acme m. d., 1-3/16" cap.
21" and 24" Steinle, m. d.
18" and 26" Libby.

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⅝", 1⅛" Cleveland, Model "A".
1¼" Gridley, Model "G".

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No. 2 Lambert, 4" bar.
No. 2 Coffman, 3¼" bar.
No. 2—Lucas, 3½" bar.
No. 3-A Universal, 3" bar.
5" bar, N.B.P. Floor Type.

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24" Bullard, "New Era".
32" King, m. d.
36" & 42" Bullard "New Era"
61" Bullard Maxi Mill.
62" Colburn, Heavy Duty.
72" King.
7'—12' Betts Extension.

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No. 3 2 Spindle Avey.
1, 2, 3, 4 Spindle L.-G.
1, 2, 3, 4, 6 Spl. Henry & Wright.

Drills (Mfg.)
No. 2 Colburn, 1, 4 spindle.
24" Cinn.-Bick., slid. head.

Drills (Radial)
5' American, full universal.
6' Western.

Gear Cutters
Nos. 3 & 12 Barber-Colman.
Nos. 9-H & 18-H G & E. hob.
No. 16 H S B Gould & Eberhardt.
Nos. 7, 6, 65, 615 Fellows.
No. 6—72" Brown & Sharpe.
6" & 18" Gleason bevel gear.
37" Gleason bevel planer.

Grinders (Plain)
Nos. 10, 13 B. & S.
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8" Sundstrand Stub Lathe.
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16"-18½"x8', L. & S. sel. g. h.
18"-20½"x6' & 8' L. & S. sel. g. h.
20"-22½"x8', 14' L. & S. sel. g. h.
24"-27½"x12', L. & S. sel. g. h.
25"—27"x16' LeBlond.
36"-40½"x14' L. & S. sel. g. h.
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36"x19' American geared head.
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Nos. 4 & 5 Cinn. h. p., s. p. d.
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No. 3 Cincinnati.

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No. 33—60" Kempsmith.
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48"x48"x14' Liberty.
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No 22 Garvin, vertical mill.
Model B Becker, vertical, 24" rotary table, m. d.

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Lathe, 34x10 Wolcott, q. c. g., comp.
Millers, No. 3 Cinc., univ., s. p. d.
Millers, No. 1½ B. & S., pl. & univ.
Miller, No. 5 B. & S., plain.
Miller, No. 1 Kempsmith pl., comp.
Miller, No. 2 LeBlond, universal.
Miller, No. 2 Cinc., univ. complete.
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6' American and Cincinnati-Bickford, Plain Radial Drills.

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BORING MILLS—VERTICAL

10—16' Niles, Extension Type.
120" Betts Gear Feed, 2 swivel hds.
76" Bullard Standard, 2 swivel heads.
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48" Colburn, power rapid traverse.

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80"x24' Pond, with countershaft.
36"x40' N. B. P., with countershaft.
30"x24' American, full grd. hd.

PLANERS

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72"x72"x18' N. B. P., 3 heads.
48"x48"x12' N. B. P., 3 heads.
36"x36"x12' Betts, 4 heads, m. d.

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84" Diamond face, 36" seg. wheel.
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7' Cincinnati Bickford, plain.

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16"x8' Prentiss geared head, m. d.
18"x8' Prentiss geared head, m. d.
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16"x6' Monarch lathe.
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Grinder, No. 2 W. & M. surface.
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Lathe, 16"x14' C. & J. gvd hd.; m.d.
Lathe, 15"x6' P. & W. semi q.c.g.; t.a.
Lathe, 14"x8' Rockford, q. c. g.
Lathe, 14"x6' Morarch, q. c. g.; t. a.
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Miller, No. 3 Cincinnati plain, s. p. d.
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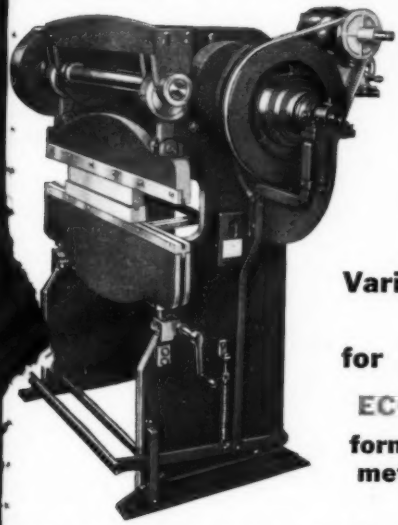

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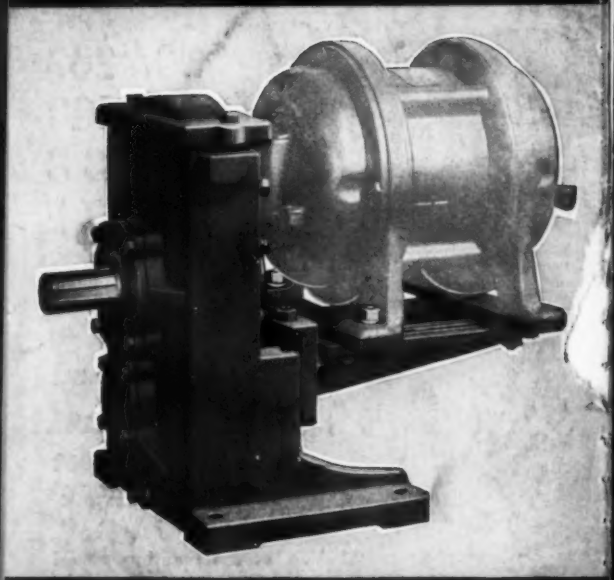

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